

COMMERCIAL FERTILIZER

CONSOLIDATED
WITH THE
FERTILIZER
GREEN
BOOK

NITROGEN

Information and Service

In addition to serving as America's leading distributor of Nitrogen, Barrett also functions as a technical service bureau.

Many of Barrett's activities are educational and advisory in character.

In the fertilizer field, Barrett technical men are in constant contact with fertilizer factory superintendents, assisting them in formulation problems.

Barrett's skill, experience and "know-how" have helped to develop the technology of manufacturing better fertilizers.

In the agricultural field, Barrett co-operates with state and federal de-

partments. For a generation, Barrett has been conducting on-the-farm tests and demonstrations, to aid in determining the most efficient use of Nitrogen on various crops and soils.

From time to time, Barrett has established fellowships at agricultural colleges for similar purposes.

Results and information obtained from these sources and activities are communicated to thousands of farmers by Barrett, through the use of many forms of educational material.

Barrett's 61 years of progress in the development of American-made Nitrogen are a record of *SERVICE*.

THE BARRETT DIVISION

ALLIED CHEMICAL & DYE CORPORATION

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WOULD YOU LIKE TO BUY A "SELF-HEALING" BAG CLOSER?

Would you like to have a Bag Closing Machine that never got out of order? ... never broke down? ... that would automatically "heal itself" if any parts began to wear?

Of course you would. A wear-immune and failure-proof machine is the ideal. We never quite achieve it—but we can come mighty close!

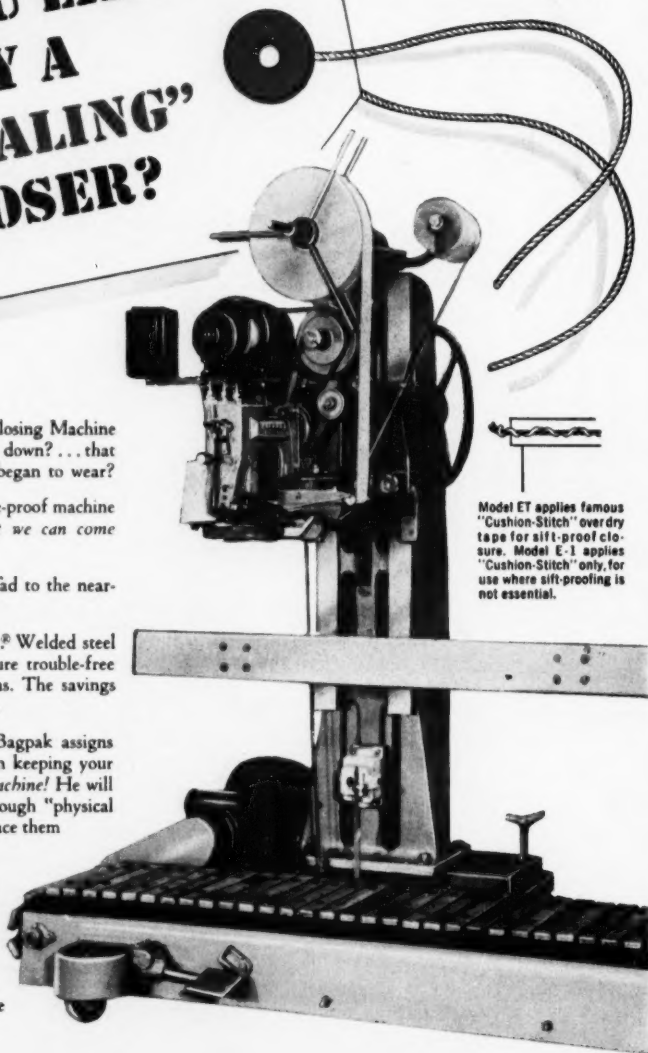
Bagpak has taken two important steps which lead to the near-ideal in Bag Closing Machines.

First, extra strength is built into every Bagpak®. Welded steel construction and heavy-duty working parts assure trouble-free operation—reduce lost time due to breakdowns. The savings on this alone can be tremendous over the years.

Second—and perhaps the most important—Bagpak assigns an experienced Service Engineer to assist you in keeping your Bagpak in tip-top shape, *for the life of the machine!* He will make regular visits to give the machine a thorough "physical check-up" ... to look for wearing parts and replace them *before* they can cause a breakdown.

This kind of "preventive service", in addition to the extra serviceability built into every part of every Bagpak, makes the Bagpak Machine the nearest thing to the ideal Bag Closing Machine you can possibly buy.

For more details about the *better* Bagpak, write today for booklet 250-C.



Model ET applies famous "Cushion-Stitch" over dry tape for sift-proof closure. Model E-1 applies "Cushion-Stitch" only, for use where sift-proofing is not essential.

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TANKAGE

*Makes Plants
GROW!*



Farmers are looking for ways to cut the cost of producing crops. Acreage allotments necessitate larger yields. To meet these requirements, farmers demand quality fertilizers to make plants grow. Correct proportions of SMIROW TANKAGE as a nitrogen source assure QUALITY because SMIROW TANKAGE is 100% natural organic . . . 90% water insoluble and 90% available. It is always in perfect mechanical condition and uniform in texture and color.

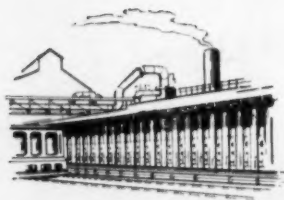
To help make your sales grow,
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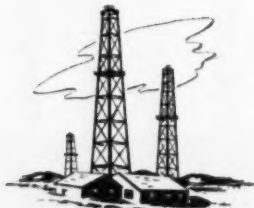
NORFOLK, VIRGINIA • CHEMICAL, ILLINOIS

Make H_2SO_4 from H_2S

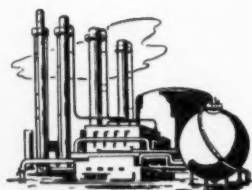
WITH A CHEMICO PLANT



H_2S DERIVED FROM
COKE OVEN GAS



H_2S DERIVED FROM
NATURAL GAS



H_2S DERIVED FROM
REFINERY GAS

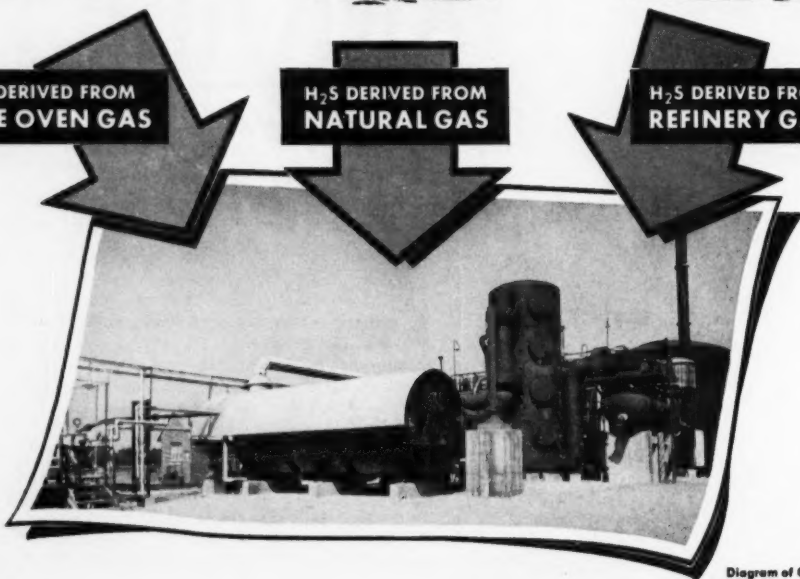
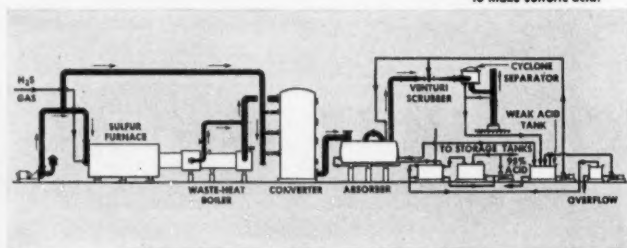


Diagram of Chemico process
which utilizes hydrogen sulfide
to make sulfuric acid.

Now that raw sulfur is in short supply, it has become necessary to manufacture sulfuric acid from other raw materials such as hydrogen sulfide. If you have hydrogen sulfide available, it will pay you to investigate Chemico's practical and proven process for making H_2SO_4 from H_2S . Chemico's new type sulfuric acid plant is especially well suited for this purpose. Or existing sulfuric acid plants can be converted.



CHEMICAL CONSTRUCTION CORPORATION

A UNIT OF AMERICAN CYANAMID COMPANY

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*Chemico plants are
profitable investments*



Trona Muriate of Potash

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Three Elephant Agricultural Pentahydrate Borax

Contains a minimum of 44% B_2O_3 or approximately 121% equivalent Borax. More economical in this concentrated form when used as an addition to fertilizer or for direct application to the soil, to correct a deficiency of Boron. Consult your local County Agent or State Experimental Station.



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COMMERCIAL FERTILIZER

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Chicago Representative

ELON A. ABERNETHY

1323 S. Michigan Ave.—Room 400

Phone Harrison 7-3655

West Coast Representative

M. A. CALDWELL

2267 W. 24th St., Los Angeles, Cal.

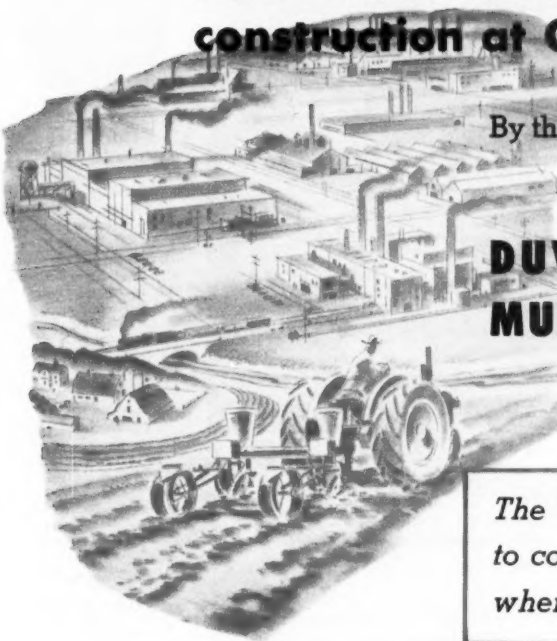
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MURIATE OF POTASH**

*The trade will be informed as
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18% NORMAL® Superphosphate

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DEROX 0.75% Rotenone

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PHOSPHORIC ACID

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PRECIPITATED BONE PHOSPHATE

KEYSTONE® AMMONIUM CARBONATE U.S.P.

SALT CAKE

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COMMERCIAL FERTILIZER

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*resists acid fumes, smoke, gases,
alkalies, heat, cold, moisture, etc.*

PLASTEEL is just what the Fertilizer Industry needs . . . a protected steel roofing and siding that is immune to all atmospheric and plant conditions. As illustrated above, PLASTEEL is triple protected steel—triple-protected on both sides of the steel sheet. That is why PLASTEEL is air-tight, weather-sealed and corrosion proof. Truly a building material that is permanent and maintenance-free! Needs no paint, no repairs. And that's not all . . . PLASTEEL is attractive in appearance, easy to handle, speedy to erect and economical!

Let Plasteel solve your corrosion and maintenance problems. Send rough sketches or complete prints of your needs. We'll submit estimates and suggestions. There is no obligation for our Engineering Service.

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TODAY
FOR
COMPLETE
DETAILS**



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JUST AROUND THE CORNER

By Vernon Mount



Good business for a long time is an easy prediction to make because even if war spending stops, the Government will step in with the shelf-programs it has stored up for just that contingency. But there seems no likelihood of any such need for years to come.

But there will be failures--and not just the usual run of casualties that the reporting agencies can predict as normal. These will be caused by Government controls. Cutting off metals and then not being able to supply war work to keep the workers in those metals busy. The Government men know this, regret it, believe it cannot be helped.

Workers will be absorbed quickly by war industry. There may be local unemployment problems, but American labor has learned to migrate fast to where the work is. Some of them migrate too fast, and get there before the plants are ready for them--which creates another unemployment problem.

The enterpriser is out of luck if he happens to fall between the two chairs. There is little can be done about him right now. He might team up with some other small plants to jointly make an "end product" with each plant making some components. This is difficult to plan. There are such groups forming, however, and they may save many a small business.

But markets will be good for almost any commodity. Business, which has been generally good for ten years, is likely to be good for another ten.

Yours faithfully,

Vernon Mount



Another new planting and growing season is in the making. This year, more than ever before, crops must be bountiful. Good commercial fertilizers will be in greater demand.

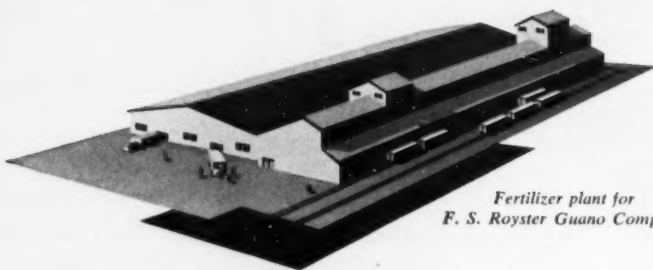
RAYMOND *MULTI-WALL* **PAPER SHIPPING SACKS**

... the finest Shipping Sacks for fertilizers, will be on the job wherever good fertilizers are packed, shipped, and used.

These tough, strong, dependable fertilizer sacks are made in various types, sizes, and strengths, printed or plain. They deliver all the goods all the way from packer to user. They're Sift-Proof, Dust-Proof and Water-Resistant.

THE RAYMOND BAG COMPANY
MIDDLETOWN, OHIO





*Fertilizer plant for
F. S. Royster Guano Company*

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Complete construction service is furnished by McCloskey. Our engineers give you the benefit of their long experience in building industrial plants. They supervise construction from start to finish. Your staff can continue its regular duties without devoting productive time to your building project.

You will be pleased like many of the largest companies around the world with your McCloskey Buildings. They have found that the complete construction services save them time and money. The modern flexible design also saves on initial investment and future maintenance.

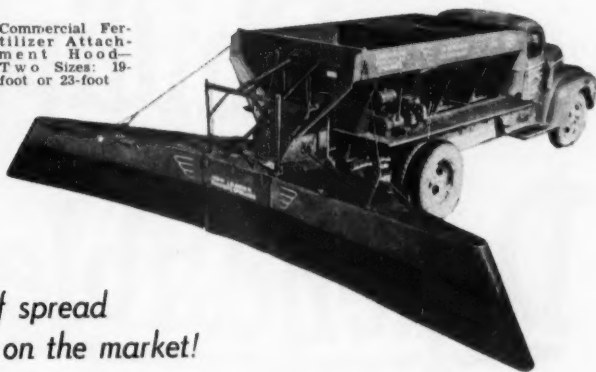
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Here's the answer to your Spreading Problems!

AGAIN!
"The NEW LEADER"
leads the field

Commercial Fertilizer Attachment Hood—
Two Sizes: 19-foot or 23-foot



*with its new
"Motor-Driven Spreader"
offering greater accuracy of spread
with the most positive feed on the market!*

SPECIAL ADVANTAGES—Uniformity of spread is not dependent on truck speed. Motor is mounted on catwalk and drives only the twin distributor discs at a constant speed, assuring full width of spread at all times together with uniform distribution.

Conveyor is separately driven from truck drive shaft by a series of V-belts to deliver the correct amount per acre—regardless of truck speed or regardless of whether the truck is driven in low, super-low or any other gear.

Conveyor speed is, therefore, positively synchronized with speed of the rear wheels of truck and at each revolution of the rear wheels, the conveyor moves a given distance regardless of the truck's speed. Amount of material delivered by conveyor does not vary with hilly or soft field conditions.

Spreader Body Lengths (inside measure) are 9', 11', 13' and 15'. Other body lengths on special order.

Note: When Spreading Attachment is folded up for road-traveling position, width is approximately 7'-5"



"The NEW LEADER" Self-Unloading Bulk Transport

The 20-ton capacity transport above is shown with elevator in place and ready to load a NEW LEADER Spreader truck. These units are proving very profitable; in bad weather they eliminate demurrage on railroad cars; fertilizer gets to the job quickly and spreader trucks can be kept working in the field. The transport, being a self-unloading unit, leaves the tractor truck free to return to pick up another transport load. These units have four individual

compartments of 5 tons each. Each compartment may be unloaded independently of the others. Compartments and rear endgate are removable so that bagged and packaged goods may be hauled instead of bulk loads. Capacity 5 tons to 25 tons, lengths from 11 ft. to 40 ft. Written warranty with all NEW LEADER equipment. Write today for specifications, prices, etc. Fast delivery service sells fertilizer!

FREE! Write for "The Story of a Custom Fertilizer Spreading Service".

HIGHWAY EQUIPMENT COMPANY, INC. CEDAR RAPIDS, IOWA
MANUFACTURERS OF THE WORLD'S MOST COMPLETE LINE OF SPREADERS



Phillips is a Dependable Source of Nitrogen!

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Phillips 66 Ammonium Sulfate is a free-flowing 21% nitrogen material! Mixes easily! Uniform crystals resist caking! Ideal for high analysis mixed goods! A fine direct application material, too!

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Phillips 66 Prilled Ammonium Nitrate contains 33% nitrogen. The small, coated prills or pellets resist caking . . . handle easily. Depend on Phillips 66 Prilled Ammonium Nitrate for uniform, free-flowing properties and top-notch crop response.

NITROGEN SOLUTIONS

Get more N per dollar! Phillips 66 Nitrogen Solutions are well suited to the preparation of high-analysis fertilizers and the ammoniation of superphosphate. These three nitrogen solutions keep handling costs low! Promote rapid, thorough curing!

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Tank car shipments of Anhydrous Ammonia (82% nitrogen) are assured to Phillips contract customers by Phillips huge production facilities in the Texas Panhandle. Write our nearest district office for full information.

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BUILD

REPEAT SALES



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With each ton of fertilizer (20 bags) the customer receives over 23 yards of quality cotton cloth for use in countless ways both in the home and on the farm. Fulton Cotton Bags are tough too, less likely to snag or tear in transit, take your product safely and more profitably to your customers. Write your nearest Fulton branch today for full details.

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Bemis Band- Label

Bemis Band-Label Burlap Bags...the bags with the wide, white paper print band...are here! They have been thoroughly tested! And in every case, the report all along the line is...

Bemis also makes regular cotton and Bemilin (dress print) bags, multiwall paper bags, and Bemis Special Thread and Mainstay Twine for bag closing—all of them superior products.



Bemis

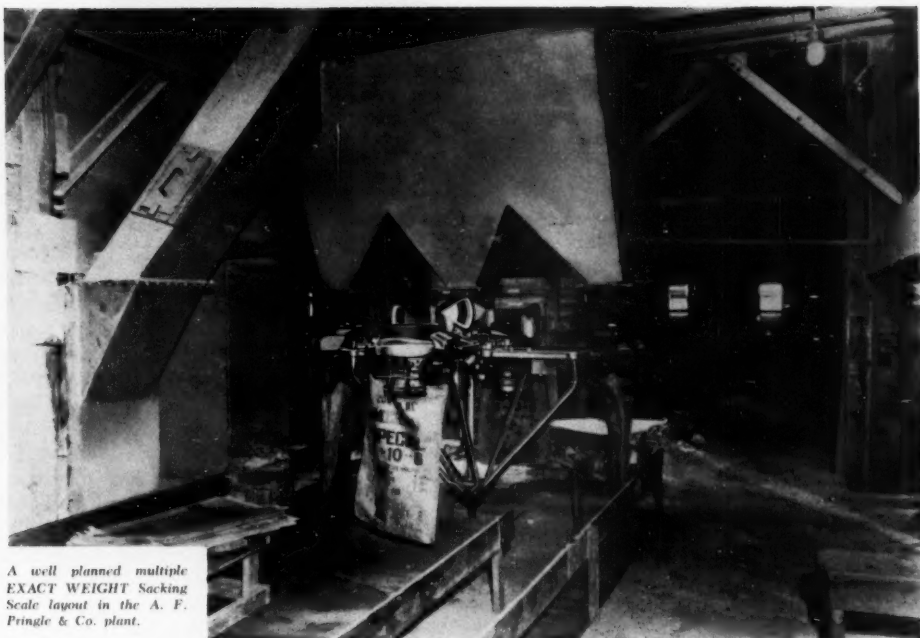
They're the best! Packing crews, handlers, management, dealers, and customers make it a landslide vote for Bemis Band-Label Burlap Bags.

Here's Why:

- ☆ Your brand identification stands out much better in the bright, colorful inks on the white paper band.
- ☆ Ink on Bemis Band-Label printing does not rub off.
- ☆ Your brand is removed with the Band-Label and thus will not be used if the bag is refilled by someone else.
- ☆ With the Band-Label removed, the bag has a higher salvage value.

Get the full story about Bemis Band-Label Burlap Bags from your Bemis man.

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Houston • Indianapolis • Jacksonville, Fla. • Kansas City • Los Angeles • Louisville • Memphis • Minneapolis
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A well planned multiple
EXACT WEIGHT Sacking
Scale layout in the A. F.
Pringle & Co. plant.

A Major Factor In Controlling Net Weight . . .

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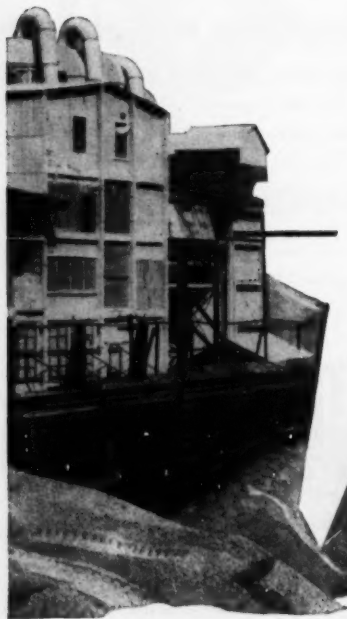
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in all Principal Cities
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THE EXACT WEIGHT SCALE COMPANY

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General Offices: 20 North Wacker Drive, Chicago 6

ASA Studies

Ammonia Problems

Groups concerned with the manufacture, distribution, and use of anhydrous ammonia and ammonia solutions have recommended that the American Standards Association organize a committee to develop safety standards, the American Standards Association announced Feb. 12. At a conference, these groups proposed that the work cover design, construction, location, installation, and operation of anhydrous ammonia systems as well as transportation and storage of anhydrous ammonia and ammonia solutions. Ammonia manufacturing plants, refrigerating, and air conditioning systems would not be included.

The problems of handling and storing anhydrous ammonia have assumed nationwide importance because of the increasingly widespread use of this gas as a soil fertilizer. Since anhydrous ammonia is usually transported in liquid form under pressure in tanks or cylinders, the relation between the strength of the tank and the pressure and temperature under which the gas is handled will be one of the problems to be given careful consideration.

The need for this work was called to the attention of the American Standards Association by the Compressed Gas Association which has offered its standards for the storage and handling of anhydrous ammonia and ammonia solutions for the committee's use. The conference recommended that the Compressed Gas Association be asked to sponsor this work.

It Seems to Me

by BRUCE MORAN



The Chinese are smart people. They name their years, so you can easily remember what happened in them. And once they had a year called "The Year of the Onion" because the average citizen was stripped, layer by layer, of his money, his property, his economic security—like the peeling of an onion.

That year-name belongs to this one in which we find ourselves. Through orders by one department, over which other Government departments shake their heads sadly, the typical business is having one layer after another peeled from it—materials, manpower, money. Our industry is no exception.

Yet we are expected, despite all the conflicting rules and rumors to produce the vital plant food upon which our armies and our civilian workers must live. Somehow we will do it.

But it would be a big help if the Government would think, and think again before it issues the policy releases which are entangling things for us. There are plenty of mighty sound men in USDA. It seems to me they have not been consulted on some of the rulings pertaining to agriculture and to fertilizer. Perhaps the rest of Government will one day catch up with the sound thinking that we know exists in USDA . . . and put it to work.

The recommendations of the conference will be referred to the Safety Code Correlating Committee of the American Standards Association for final decision as to whether a committee will be set up under ASA procedure.

Groups represented at the conference were: American Institute of Chemical Engineers; ASA Chemical Industry Corre-

lating Committee; American Society of Refrigerating Engineers; American Water Works Association; Association of Casualty and Surety Companies; Compressed Gas Association; Interstate Commerce Commission; Manufacturing Chemists Association; National Safety Council; U.S. Coast Guard; U.S. Department of Labor, Division of Labor Standards.

Sulfur Situation for 1951

By T. H. TREMEARNE

Industrial Specialist Office of
Materials and Facilities Production
and Marketing Administration
USDA

The importance of sulfur and sulfuric acid for the manufacture of industrial and agricultural products has been recognized for many years. Until the fall months of 1950 sulfur consuming industries had little reason to suspect that a shortage of sulfur and sulfuric acid was rapidly approaching. The dependency of sulfuric acid production in the United States and many foreign countries on sulfur bearing ores and from by-product sources has been well established.

There is no definite interchangeability in our domestic requirements between sulfur or sulfur bearing materials such as pyrites. It is known that some sulfuric acid manufacturers use both sulfur and pyrites. However, the choice of material is controlled by the individual plant facilities. A change-over of domestic plants to the use of pyrites would be costly, delay output of end products and require a large amount of equipment which is not readily available. The lack of assurance of a constant source of supply of pyrites of reasonably high sulfur content is also a deterring factor.

The importance of sulfur and sulfuric acid for agricultural purposes only will be discussed. The principal use of sulfur in agriculture is for the production

Commercial Fertilizer wishes to extend special thanks to Mr. Tremearne and to USDA for this article. We asked for it to be prepared especially. We know how heavily laden are all USDA personnel just now. But they cheerfully and promptly researched the data and got it to us in time for our publishing schedule. Our May issue will feature USDA and its work, as was the case last year at the same time.

Uses of Sulfur (Equivalent Long Tons)			
	1948	1949	1950
Fertilizers—total use	1,289,000 1/	1,386,000 1/	1,488,000 1/
Other agricultural uses	208,000 2/	208,000 2/	208,000 2/
Total agricultural uses	1,497,000	1,594,000	1,696,000
Production of native sulfur	4,869,210	4,745,014	5,192,184
Percent of production required for total agricultural uses	30.7	33.6	32.7

1/ Computed from data supplied by the Bureau of Mines and the Bureau of the Census.

2/ These are tentative estimates and are subject to later revision.

1951 Requirements
Based on data developed by the Office of Materials and Facilities with respect to phosphate (P_2O_5) and ammonium sulfate required for crop production and other agricultural requirements in 1951, it is estimated that the 1951 requirements of sulfur for such purposes, as compared with an estimated sulfur output for 1951, are as follows:

Uses of Sulfur (Equivalent Long Tons)	
	1951
Fertilizers—total use	Requirements 1,755,000
Other agricultural uses	219,000
	1,974,000
Production of native sulfur 1951	5,000,000
Percent of sulfur production required for total agricultural uses	39.5
The increases in agricultural requirements for sulfur (equivalent) in 1951 as compared with 1950 usage are:	
Fertilizer use	18.0 percent
Other agricultural uses	5.0 percent

of sulfuric acid. This acid is required for the manufacture of fertilizers, such as superphosphates and ammonium sulfate. Other agricultural uses of sulfur are for dusting and spraying, for

plant disease control, as soil amendments and as fumigants for grain preservation. Sulfuric acid is also used for cotton-seed delinting and in processing fats and oils.

A comparison of the amount of sulfur (equivalent basis) used for the production of fertilizers and the other agricultural purposes and the annual output of sulfur during the years 1948, 1949 and 1950 follows:

The largest increase in 1951 requirements will be for the production of superphosphates. The total equivalent sulfuric acid required for superphosphates is estimated at approximately 4,347,000 tons (100 per cent H_2SO_4 basis). Ammonium sulfate requirements for 1951 are only slightly greater than in 1950. The estimated equivalent sulfuric acid required for ammonium sulfate is approximately 1,-

367,000 tons (100 per cent H_2SO_4 basis). The small increase for other agricultural uses reflects that used for insect control.

The requirements shown for equivalent tons of sulfur are subject to some revisions but are based on factual data. The domestic fertilizer industry, insect and pesticide manufacturers and others producing materials for agricultural purposes must be provided with sufficient sulfur or its equivalent, as indicated, to assure the production of food, feed and fiber in quantities essential to the national defense.

The foregoing requirements for agriculture were pointed out in the testimony presented by USDA at the recent hearing on Fertilizer Supplies before the Special Fertilizer and Farm Machinery Sub-committee of the House Committee on Agriculture.

At the hearings, the USDA made several recommendations with a view toward providing adequate supplies of sulfur or sulfuric acid for agricultural use.

First. Effort should be made to increase total sulfur production, especially through measures to recover all by-products of sulfur which are escaping from smelters in the form of sulfur fumes.

Second. Controls should be placed in effect to channel maximum amounts of sulfur to agricultural uses.

It was stated that some European manufacturers have successfully substituted nitric acid for sulfuric acid in the treatment of phosphate rock to produce phosphate fertilizers. The Department of Agriculture is investigating the feasibility and

desirability of using the nitric acid process in this country with a view to encouraging its use here to conserve sulfur.

Methods of conservation of sulfur and sulfuric acid and recovery of by-products of sulfur

from various sources are being considered. However, there is no apparent solution to the sulfur shortage problem that indicates an early easing of the tight supply.

HOUSE COMMITTEE HEARING AND SULFUR RECOMMENDATIONS

The Special Subcommittee on Fertilizer and Farm Machinery of the House Committee on Agriculture has made its conclusions and recommendations resulting from the fertilizer and sulfur hearings, February 20-23. These have just been approved by the House Agricultural Committee.

Conclusions

(Summarized by NFA)

Sulfur Supply: Demand (including exports) will exceed supply in 1951 by more than 500,000 tons . . . Little immediate prospect of increasing native sulfur supply . . . Except for reuse of acid now being wasted, 1951 problem is to distribute supply efficiently.

Agriculture's Position: No major stockpiles of any agricultural commodity exist so 1951-52 consumption must be produced this year . . . Abundant production **only way** to get food as an instrument of peace and **best way** to prevent domestic inflation . . . Such production **cannot be achieved** without **more** fertilizer than used last year . . . In 1949 agriculture was by far Nation's largest single user of sulfur with 34.4 percent of domestically produced acid used for fertilizer . . . To meet 1941 acreage goals a minimum of 479,000 more tons of phosphate and nitrogen in fertilizer than in 1950 required to produce quantity of products sought. Without the required acreage **even more** fertilizer needed.

Distribution Policies: Critical materials, including sulfur and sulfuric acid now being allocated and distributed **without any policy determination as to essential nature of agricultural production** . . . Head, Operating Division, NPA, testified that **he has no policy directive** to guide him in determinations nor has he staff member versed in agricultural requirements . . . Present "DO" ratings and orders completely disregard agricultural requirements and may quickly create situation where availability of materials for agriculture will be reduced to zero . . . In contrast to other prominent agencies no agency representing agriculture is authorized to issue "DO" ratings . . . USDA has not been consulted in drafting allocation order for sulfur despite rumors of circulation to other agencies.

Exports: For 25-30 years U. S. has been chief world supplier of elemental sulfur although found in other forms in many countries . . . Exports previously averaging 30 percent of U. S. production still being made at annual rate of 800,000 tons (not including Canada) or 22 percent of anti-

pated 1951 elemental sulfur production . . . Spain virtually unlimited source of highgrade pyrites but no real effort has been made by ECA to get European industry to use it although in case of war European industry would probably have to depend almost entirely on its own supplies.

Stretching Present Supplies: Little prospect of bringing into production new or additional sulfur sources for 1951 . . . Numerous ways in which sulfur now being wasted or discarded in industrial processes can be reclaimed for fertilizer production or rehabilitated for reuse in other industry although recapture or reuse possibility apparently unprofitable at present elemental sulfur price . . . More effective use of phosphate fertilizers might be obtained by Federal and State review of mixed fertilizer formulas with objective of reducing phosphate application to crops which can get along temporarily on smaller amounts so that the available material may be utilized for those crops where increased production is directly dependent on phosphate application.

Planning for the Future: Prospect of substantial increase in elemental sulfur production apparently not encouraging but sulfur can be reused (at a price) if an adjunct to some industrial processes, i.e., coking industry, could obtain from gases of its own ovens now being wasted 60 percent of sulfur it needs to convert all its ammonia to ammonium sulfate . . . Other practical and substantial sulfur sources: sour natural gas, smelter fumes, industrial fumes and gases, pe-

troleum industry, pyrites and gypsum . . . Construction of billions of dollars worth of steel, chemical, petroleum and other plants now being approved with

Government assistance but no evidence disclosed that defense agencies are planning for or requiring byproduct sulfuric production in this program.

RECOMMENDATIONS

(Full Text)

1. That those in charge of the defense program recognize and act upon the elementary fact that agriculture is an essential defense industry and should be given that status in any allocation of critical materials.
 2. That advisers and consultants, under the supervision and direction of the Secretary of Agriculture, qualified and authorized to present the requirements of agriculture, be appointed to participate with the policy-making officials at the highest levels of the defense program administration agencies and authorities.
 3. That the export program be critically reviewed with the objective of finding out how much American sulfur the industries of other countries can do without—not how much they would like to have.
 4. That the present users of sulfur and sulfuric acid be carefully surveyed to discover how much of this material now being wasted or discarded can be recaptured or reused and that positive steps be taken to see to it that this material is saved and utilized.
 5. That all possible long-range sources of sulfur and sulfuric acid be examined and analyzed by competent and appropriate governmental agencies—and that sulfur recovery, production, or reconstitution facilities be required, where appropriate, as a condition of the approval of any facility for accelerated amortization or any other such governmental assistance.
 6. That research be intensified to discover whether there is a practical and economic method of producing phosphate fertilizer without sulfuric acid or with proportionately reduced quantities of that material.
-

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NPK SITUATION FOR 1951

The Fertilizer Situation for 1950-51 is the eighth in a series of reports issued by the U. S. Department of Agriculture on annual supplies of fertilizer for United States farmers.

In the preparation of the report, helpful assistance was given by the Bureau of the Census, Department of Commerce; Bureau of Mines, Department of the Interior; the several trade associations; members of the industry and the Bureau of Plant Industry, Soils, and Agricultural Engineering, Department of Agriculture.

This assistance is gratefully acknowledged.

The 1950-51 Outlook

For the 12 months ending June 30, 1951, the supply of nitrogen and potash for fertilizer purposes should exceed all previous records. However, the supply of superphosphates in 1950-51 will be less than in 1949-50.

Nitrogen (N)

During 1950-51 the quantity of nitrogenous fertilizer in all forms expected to be available for use by farmers is placed at approximately 1,250,000 tons nitrogen (N) content basis as compared with the available supply of approximately 1,030,000 tons in 1949-50 and of 1,005,000 tons in 1948-49.

The 1950-51 estimate assumes that imports will be slightly higher than in 1949-50 and that commercial exports will be lower.

Details of the 1950-51 estimated nitrogen supply by type

The report has been prepared by L. G. PORTER and T. H. TREMEARNE, Office of Materials and Facilities, Production and Marketing Administration, under L. B. TAYLOR, Director of the Office.

Table 1.—Estimated fertilizer nitrogen supply for 1950-51 compared with 1949-50 and 1948-49: United States and possessions

(In short tons of 2,000 pounds nitrogen content basis)			
Source and form	1950-51 1/	1949-50	1948-49
U.S. commercial production 2/ for fertilizer purposes (not)			
Synthetic ammonia	890,000	773,000	623,000 3/
Byproduct ammonia	195,000	167,000	197,000
Natural Organics	40,000	38,000	30,000
Total	1,125,000	978,000	850,000
Imports — fertilizers	225,000	220,000	217,000
Exports — fertilizers	100,000	168,000	62,000
Difference	125,000	52,000	155,000
Available for fertilizer purposes	1,250,000	1,030,000	1,005,000

1/ Preliminary estimates

2/ Includes TVA anhydrous ammonia production

3/ Includes approximately 58,000 tons supplied to commercial channels from Army-operated plants

Bureau of the Census, Bureau of Mines, and industry components

Table 2.—Estimated phosphate supply for 1950-51 compared with 1949-50 and 1948-49: United States and possessions

(In short tons of 2,000 pounds of P ₂ O ₅ content)			
Source and form	1950-51	1949-50 1/	1948-49 1/
U.S. Production			
Normal superphosphate	1,478,000	2/ 1,685,000	1,629,000
Concentrated superphosphate	313,000	288,000	224,000
Wet base goods	12,000	10,000	11,000
Other 3/	150,000	152,000	143,000
Total	1,953,000	2,135,000	2,007,000
Imports 4/	29,000	28,000	25,000
Total U.S. supply	1,982,000	2,163,000	2,032,000
Exports:			
Normal superphosphate	50,000	84,000	94,000
Concentrated superphosphate	9,000	16,000	12,000
Nitrogenous phosphatic material and mixed fertilizers	2,000	3,000	16,000
Total	61,000	103,000	122,000
Net supply U.S. and possessions	1,921,000	2,060,000	1,910,000

1/ Data revised.

2/ Includes adjustment to reflect output of non-reporting plants estimated at approximately 50,000 tons P₂O₅ annually.

3/ Includes estimated available P₂O₅ content of metaphosphate, defluorinated phosphates, basic slag, by-product phosphates, liquid phosphoric acid, ground phosphate rock, and total P₂O₅ in organic materials used as fertilizer.

4/ Includes P₂O₅ content of ammoniated superphosphate and ammonium phosphates and complete fertilizers.

Bureau of Census, Department of Commerce, and special reports from industry components.

and class of materials are shown in table 1 with comparative data for the two previous fiscal years.

Phosphates (P_2O_5)

Production of available phosphoric acid in normal and concentrated superphosphates and wet base goods for the fiscal year ending June 30, 1951 will total approximately 1,803,000 tons, somewhat less than the output of the previous year.

It is assumed that production of miscellaneous forms of phosphatic fertilizers, such as calcium metaphosphate and phosphoric acid used for fertilizer as such, will be about the same as in 1949-50. Imports and exports of processed phosphatic fertilizer are not large in relation to total production.

Taking these factors into consideration, it is estimated that the aggregate domestic supply of phosphatic fertilizers in all forms and from all sources—including net imports—for 1950-51 will comprise some 1,921,000 tons P_2O_5 basis as compared with about 2,060,000 tons in 1949-50 and 1,910,000 tons in 1948-49.

The 1950-51 phosphate supply is shown in detail in table 2 with comparative data for 1949-50 and 1948-49. Some revisions and adjustments have been made for 1949-50 and 1948-49 on the basis of the more complete information now available.

Potash (K_2O)

Based on a continuing high level of production during the remainder of 1950-51 (potash fiscal) year, it is estimated that domestic deliveries of potash,

plus imports, will reach approximately 1,300,000 tons K_2O content. This compares with the deliveries of 1,125,000 tons in 1949-50 and 1,070,000 tons in 1948-49.

In table 3 the potash supply

is shown in detail with comparative data for 1949-50 and 1948-49. It should be noted that in considering potash deliveries data are based on the potash fiscal year June 1 through May 31.

Table 3.—Estimated potash supply for 1950-51 compared with 1949-50 and 1948-49: United States and possessions
(In short tons of 2,000 pounds of K_2O content)

Source and form	1950-51	1949-50	1948-49
U.S. production			
60 percent muriate of potash	1,041,000	866,000	863,000
50 percent muriate of potash	104,000	96,000	87,000
Sulfate of potash and sulfate of potash magnesia	95,00	86,000	76,000
Manure salts	10,000	21,000	66,000
Total	1,250,000	1,069,000	1,092,000
Organic and byproduct 1/	25,000	25,000	20,000
Total domestic sources	1,275,000	1,094,000	1,112,000
Imports	115,000	118,000	19,000
Total U.S. supply	1,390,000	1,212,000	1,131,000
Exports			
Canada	67,000	67,000	43,000
Cuba	8,000	6,000	5,000
Other countries	15,000	14,000	13,000
Total exports	90,000	87,000	61,000
Net supply U.S. and possessions	1,300,000	1,125,000	1,070,000

1/ Includes potash content of oil-seed meals, cotton-hull ash, and byproduct residues utilized for fertilizer.

The American Potash Institute, Bureau of the Census, and Department of Commerce.

NACO NAMES MORRISON PRESIDENT MOVING MAIN OFFICE TO CHARLESTON

Kenneth D. Morrison has been named President and a director of Naco Fertilizer Company, and Board Chairman B. J. Oehlett, Jr. also has announced that the main offices will be moved to Charleston, S. C. about April 1. The move is being made to put headquarters closer to the plants in South Carolina and Florida. Naco also has plants in Ohio.

Mr. Morrison is well known in the fertilizer industry, has been in the past with Davison Chemical and with International Minerals and Chemical, and for 25 years a resident of Baltimore.

Mr. Morrison succeeds R. C. Simms, who has resigned to become associated with a mid-Western chemical concern.



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SOIL MANAGEMENT A PROBLEM OF NATION—PARKER

Effective soil management is currently one of the nation's most pressing soil problems, in the opinion of Dr. F. W. Parker, soils authority of the U. S. Department of Agriculture. Good soil management requires more than the application of only a few, simple, universal rules. A scientific approach to the problem, he says, shows why.

Soil management, according to Dr. Parker, who as Assistant Chief of the Bureau of Plant Industry, Soils, and Agricultural Engineering, heads the research in soils, fertilizer, and irrigation, is the efficient production of quality crops along with continued improvement in soil productivity. The fundamental requirements of a productive soil include the most favorable combination of soil moisture and air, an ample supply of needed nutrients, root room, and the absence of harmful factors.

Soil structure is the key to ideal soil moisture and air condition, Dr. Parker's research shows. Soil with good structure retains an ample supply of moisture and enough air to allow the roots to breathe. Heavier textured soils are most often faced with moisture and air problems. Maintenance of soil structure is becoming a big problem on many of the predominantly clay soil farms in the Great Plains, the Corn Belt, and the Black Belt of Texas, Mississippi, and Alabama. In most of these areas,

structure is associated with the loss of from 25 to 50 percent or more of the soil organic matter.

Correcting this condition largely means protecting the soil from further breakdown and giving it a chance to rebuild. Dr. Parker recommends the growth of sod crops with good root systems plus the use of green manure crops, crop residues, composts, mulches, and farm manures.

Fertilizers have little direct effect on soil structure, he says, but when used to promote the growth of the sod and green manure crops and deep-rooted legumes, fertilizers indirectly rebuild the soil. Fertilization, by increasing crop yields, often doubles or trebles the amount of organic matter returned to the soil as crop residue or farm manure.

Fertilizers also play an important role in the number and quantity of needed soil nutrients. Since a 100-bushel corn crop takes 400 pounds of mineral nutrients from the soil in from 120 to 160 days, it is easy to see than continually repeating such a process without re-supplying the soil with nutrients, will soon devastate it.

Even virgin soils are not necessarily stocked with nutrients. Most virgin soils lack some important mineral: many lack several of them. The parent material of the soil, the vegetation that grows on it, the rainfall, tem-

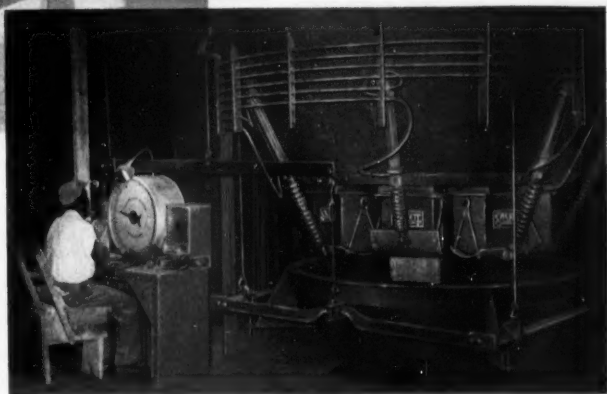
(Continued on page 34)

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Grasslands FOR Abundance

Talk by W. A. Minor, Assistant to the Secretary of Agriculture, at the 48th Annual Convention of the Association of Southern Agriculture Workers, Memphis, Tennessee, Feb. 6, 1951.

You may be sure that I am glad to have this opportunity to meet and talk with my friends in the Association of Southern Agricultural Workers. The pleasure is all the greater because you have asked me to come here to tell you about the grasslands program of the Department of Agriculture and the Land-Grant Colleges.

Through this program we will help American farmers and ranchers in all the 48 states to back up the Nation's mobilization. This is the primary goal of the program.

Let me say at the outset, however, that my task tonight is in many ways a comparatively easy one.

The patriotic spirit of the people in the South has been proven over and over. This means that an effort like the grasslands program, which will strengthen the Nation for years to come is bound to have full support and wide participation.

But there is more than this to ease the way for grasslands improvements here in the Southern States. The South is already grass-conscious. You have learned the value of good grass, and in recent years you have turned more and more to grasslands and livestock. This Association itself is on record in favor of better pastures as a step toward agricultural prosperity, the wise use of our soil resources, and good nutrition for the Nation. Many of the Land-Grant Colleges and other organizations already have underway successful programs devoted to

Foreword by COOPER MORCOCK
Agronomist, Southern District
The Barrett Division, Allied Chemical & Dye Corp.

One of the trends observed at the recent meeting of the Southern Agricultural Workers at their 48th annual convention in Memphis, February 5-7, was the greater appreciation of fertilization and emphasis being placed on grass. W. W. Myers, USDA, Beltsville, in his talk on "Grass Land Farming in Europe," said the Dutch have learned:

1: Cattle can be produced on forage alone.

2: Feed units can be produced in more abundance from grass than from grain.

3: The value of applying from 100-250 lbs. of Nitrogen per acre per year in 4 to 6 applications.

4: Legumes are not needed as heavily for fertilized grass because of the higher grass yields and high protein content of young grass.

T. G. Hogg, Mississippi, reported TDN from pasture is equal to TDN in 129 bu. corn. To keep in good growing condition, this needs 240 lbs. of Nitrogen per acre per year, of which the clover can furnish 100 lbs. when grown with the grass.

G. W. Burton, Tifton, Georgia, stated TDN can be increased in the South by use of fertilizer. On coastal bermuda grass 400 lbs. of Nitrogen per acre produced 8 tons of dry matter. Total cost was \$11 per

ton in the shed. He concluded: "The South is definitely going to grass."

W. A. Minor, Asst. to U. S. Secretary of Agriculture, Washington, said a grass land program is to be emphasized by USDA for sustaining animal production and the conservation of resources. Grass land farming is not to replace other needed crops, but is to supplement them by utilizing idle land. USDA is to look for effective ways to assist farmers in their grass land program by examining:

1: Credit structure. 2: Tenure Stability. 3: Farm Management program. 4: Fertilization. 5: Varieties. 6: Seed supply. 7: Utilization of forage. 8: Engineering, manufacturing and handling of grass land products. 9: Conservation payments.

The grass land program has a U. S. steering committee composed of representative directors of: (1) Experiment stations; (2) Extension Services, and (3) Two assistants to the U. S. Secretary of Agriculture. Each state or region is to develop details for the program for its respective area.

In the opinion of the writer, the grass land program will have a lasting effect particularly in increased fertilizer usage and bulk spreading in the Southeast section.

RED FACE DEPT

Last month we ran a Cotton article by Cooper Morcock, Agronomist, Southern District, The Barrett Division, Allied Chemical & Dye Corporation. It was OK, and met with wide approval—except that folks pointed out to us gently that we had omitted Coop's business connection. And as he is, justly, mighty proud of that connection, our face is red—and we hasten to make it right. Just a slip, Coop. Fact is, it was on the copy, on the galley—and we don't have the faintest idea how it failed to make the final printing.

the improvement of grasslands and their better management.

So the story of grasslands is not wholly a new story here in the South. What many of you are now doing fits the pattern as well as the goals of the national grasslands program which is taking form throughout the Nation.

Let me again point out that the grasslands program—in the Nation, in the States, and in the regions—fits the pattern of preparedness which has become the design for living among the free nations of the world in the decade of the 1950's. We are living and working in a critical era. Today we are meeting the deadly challenge of Soviet communism with a program of military and industrial mobilization which will grow in size and power. The present drive is for military security by building up our armed forces and the industrial production necessary to equip and supply them. This is understandable. These are the fields in which we must immediately turn our great potential power into fighting strength.

The critical need to increase our strength is laying its heavy responsibilities upon us all. Here in agriculture we have an essential task. The Nation's mobilization cannot prove successful unless it is supported with food, fiber, and other farm products. This is neither a simple nor a single task. We must produce enough for our military forces, for our civilian population, for safe reserves, and for the aid and relief of

the free nations of the world which are hard pressed by hunger as well as by communist aggression. We cannot afford to let hunger fight as a silent ally on the side of communism.

This is what the Nation requires from agriculture. We should rest our future calculations on the belief that these needs can be expected to become increasingly heavy in the course of the critical situation which we are facing—not only this year, but across the next several years. Then and only then can we see that the essential task is to use every acre so that it contributes its share to meeting those overall needs.

Production comes first, especially of those commodities in which we may be troubled by short supplies. But, in and by itself, production is only one part of the job. We have the equally important responsibility of aiding farmers in maintaining and enlarging the productive capacity of their soil. This is food and fiber insurance. The Nation needs this protection against the unforeseeable necessities of the future.

These are basic reasons for the immediate emphasis on grasslands. The urgent requirements of the national emergency for food and fiber can be safely met only by a high level of production which we can maintain throughout the foreseeable future. This calls for the maximum contribution which grasses and legumes can make to a sustained and balanced abundance of farm products. Let me point out once again—for emphasis' sake—that these products include all foods and fibers.

We will make faster progress in grasslands farming as more and more farmers learn the true value of grasses and legumes—not only in producing meat and other livestock products, but also in assuring larger yields of grain, cotton, and other cultivated crops. During all the generations that we have been cash-and-row-crop farmers here in America have seen abundance flow forth as we expand our acreage in field and row crops. This has led us to the belief that the sure-fire

answer to emergency needs is larger acreages only. This could be the road to disaster. It is time we heeded the fact that productive capacity is a far better guarantee of abundance. Big acreages alone are not enough—year in and year out.

One of the first tasks we face is to rid ourselves of the mistaken idea that the spigot of agricultural abundance is turned off by turning to grasslands. Then we will be free to drive toward the goal of balanced grasslands farming with increased vigor and confidence. Through better grasslands for America, agriculture has an excellent opportunity to bring farm production into more lasting balance with the present and future needs of the Nation. We should take advantage of this opportunity at once by making grasslands improvements a must in the order of business on American farms.

Here are a few examples of what the grasslands program can mean in successfully meeting the challenge of sustained high-level production.

First, let us look briefly at the Nation's permanent grasslands. There are about a billion acres in all, and most of them are unimproved. They possess an enormous productive potential, and much of it could be turned into reality by the scientific advances which have already been tested and proven in practice. The production from hundreds of millions of these acres could be doubled and tripled by liming, fertilization, reseeding with improved varieties of grasses and legumes, improved management, and similar practices.

Second, let's examine what grasslands can mean as livestock feed. Here we find that improved grasslands can produce most of the feed needed for either beef or dairy herds as pasture, hay, or silage. High-producing dairy animals, averaging 8,000 pounds of milk a year in comparison with the national level of 5,000 pounds, have maintained their production on grass of good character without supplemental feeding. Here in the South, the experi-

ment stations have regularly produced grass-fed beef cattle which have been marketed in the choice grade for which grain feeding is popularly considered to be a requirement. With many more records like these on tap, we can see that improved grasslands can safeguard our grain supplies from excessive drains in any emergency and boost the production of meat and other livestock products at the same time.

Third, now let's see what grasses and legumes can do on cropland. Here we find experimental results which show the improved forage crops outperforming corn and other feed grains. Not only did the forage yield more feed per acre, but it did so at lower cost and with greater return for labor. These results indicate that grasslands can become an excellent bet as a paying crop in the event of a limited labor supply.

Fourth, let us turn now to the Nation's diet. Here we find that 40 percent of the families get less than enough calcium; 50 percent, less than enough protein. The preferred sources of these essential food elements are the end products of grasslands farming, particularly meat and milk. Improved grasslands will give the Nation's farmers the broader base of assured feed supplies on which to expand their production of meat, milk, and other livestock products.

Fifth and lastly, let us weigh the importance of grasslands in the crop rotation. Here we can see the contribution of grasses and legumes to the sustained maximum production of other cultivated crops. Cotton, corn and other crop yields are much higher in rotations which employ grasslands than in rotations without sod crops, in some cases as much as four to six times higher. All-out production of food, fiber, and other crops cannot be maintained throughout a long period of mobilization and high demand if the grasslands are dropped from the rotation. With improved grasslands in sound rotations, we can build up the yields of other crops and count up larger production from fewer acres.

So far we have been looking at

the grasslands program and grasslands farming in the terms of what they mean in the production of food and fiber for the Nation. Perhaps it would be well for us to come to a clear understanding of what we mean by grasslands agriculture. For many people this is too often a catch phrase, and it usually brings to mind the erroneous picture of a universal carpet of grass and the abandonment of cultivated crops. The emphasis I have given to the place of grasses and legumes in sound rotations should prove reassuring to you that it is not at all the goal of the grasslands program.

By the definition we are employing in the program, grasslands farming is a system of farming in which grasses and legumes are used in balanced proportions for hay, silage, pasture, and soil conservation and improvement for high production and profitable farming. Grasslands farming will progress as grass-

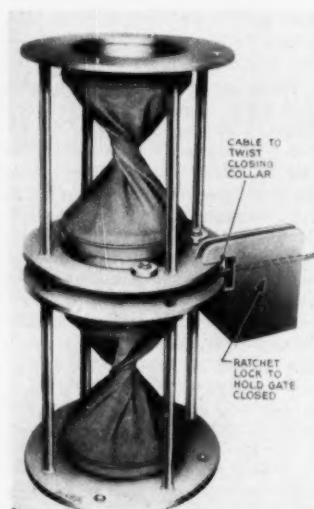
es and legumes are properly fitted into individual farm plans in ways which will improve farm income and maintain soil resources.

The foundation for the program exists in the information already available which shows that farm income can be increased substantially in many areas through grasslands improvement. The grasslands system envisaged in this program will not displace other types of enterprises to any great extent; nor will it require extensive displacement of farm people. Grasslands developments will supplement present enterprises and provide for fuller and more effective utilization of the resources on the farms now in operation.

Our present farm situation permits us to undertake calculated preparations for an extraordinary increase in the demands for farm products which may bear upon us in the course of our struggle with communism. In view of last year's good crops, we can look into the future with confidence which comes from the knowledge that we have plentiful supplies of food and feed.

They enable the Land-Grant Colleges and the Department to accept the challenge and go forward with redoubled and concerted efforts to assist farmers with the task of improving their grasslands. Some very effective programs are already under way in this direction. Many farmers the country over have used the post-war years to increase the productive capacity of their farms with new equipment, better buildings, larger and better livestock herds, and more conservation work. We can give these activities national scope and guide them in building enormous reserves of productive capacity by a program devoted to better grasslands.

If the program is to be made known and carried out effectively, farmers must have the support of the combined efforts of the Department of Agriculture agencies, the Land-Grant College research and extension staffs, and other agencies



A "Twistite" double closure bin valve in closed position, showing how rubber sleeves are held in twisted position by cable and lock mounted on valve. Stephens-Adamson Mfg. Co. makes them, and will tell you all about them if you will write them at Aurora, Illinois, Los Angeles or Belleville, Ontario, Canada, asking for sheet 254-A.

(Continued on page 48)



IMPORTANT ANGLE ON FARM PROFITS

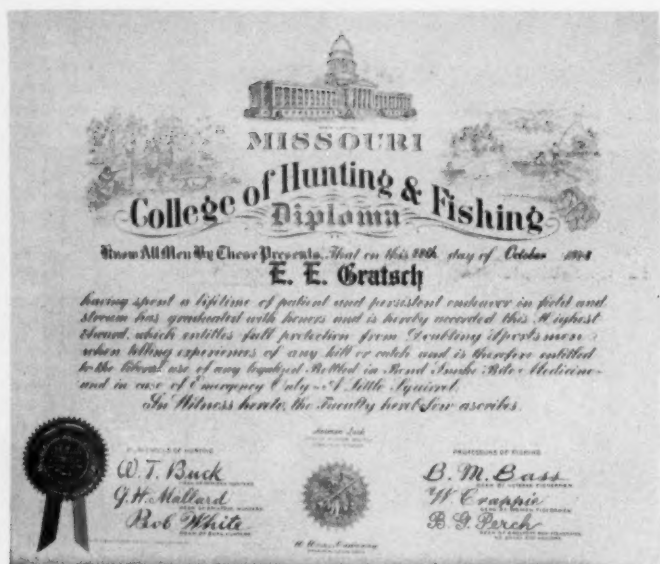
The profits of this farm and many others like it have a direct relationship to the products of our company. For successful, profit-making farming almost always calls for the wise use of the correct type of fertilizer.

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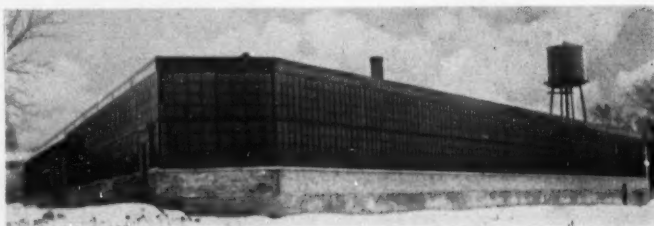
A Fish Story

Because of sewing machines, a number of leading fertilizer executives are now solemnly and formally alumni of the American Colleges of Hunting & Fishing, complete with sheepskin and fully entitled to use any legalized bottled in bond snakebite medicine. They are also entitled to be protected against the doubts of certain dubious persons who are forced to listen to their tales of the fish that got away.

These gentlemen include Ray L. King, Georgia Fertilizer Company, Valdosta, Georgia; J. E. To t m a n, Summers Fertilizer Company, Baltimore, Maryland; George E. Petitt, Potash Company of America, New York; George Morgan, Morgan Bros., Richmond, Virginia, and Weller Noble, Pacific Guano Company, Berkeley, California. To

each of these a diploma has been sent, and they are duly invested with the regalia of their proud status.

Now to get back to the point where sewing machines were responsible for this wave of recorded erudition; Travis S. Whitsel, who is much better known as "Cap" Whitsel is general manager of Union Special Machine Company who, as all



Here's the new addition recently completed by Union Special Machine Company at their Huntley, Illinois, plant. Planned a number of months ago, it was completed just as the demand for sewing machines started rising to new high levels.

COMMERCIAL FERTILIZER

know, make sewing machines for fertilizer plants and elsewhere. In the course of his duties, Cap devoted time to piscatorial discussion with Elmer E. Gratsch, manager of the Union Special branch at St. Louis. There may have been a gleam of doubt in Cap's eye, or not—at any rate Elmer produced his diploma from the Missouri division of his Alma Mater, and Cap was so impressed that he must not only become an alumnus himself, but must make sure his good friends and fellow fisherman in the fertilizer industry were also duly qualified.

And so the presentations were arranged, and have been made.

All is quiet on the streams just now—but it is suspected that in the depths of the still waters, where the School of Fish is assembled, retaliatory measures are being bred. When it is possible to report these, you may be sure Commercial Fertilizer magazine will report them.

Northern California CFA Members Meet

The first meeting in 1951 of active Northern California CFA member was recently held in the Alexander Hamilton Hotel, San Francisco, with President J. M. Quinn in the chair, and some fifty members present. Questions concerning price control were informally discussed.

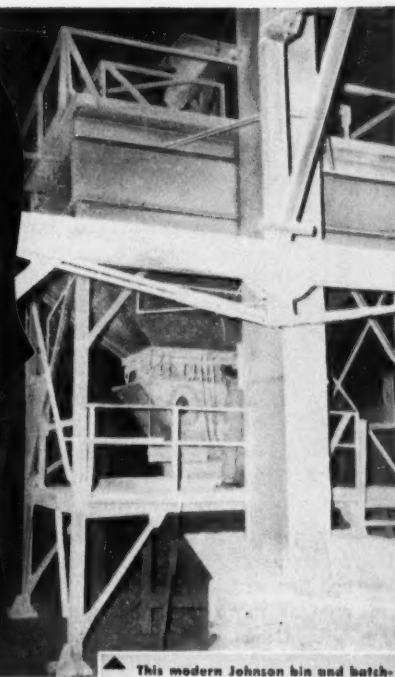
South Carolina Tour

B. D. Cloaninger, Clemson, invites our readers to attend a tour of the Experiment Stations at Charleston and Summerville, South Carolina, Wednesday May 16. A dutch barbecue will be served at Summerville.

JOHNSON fertilizer PLANT

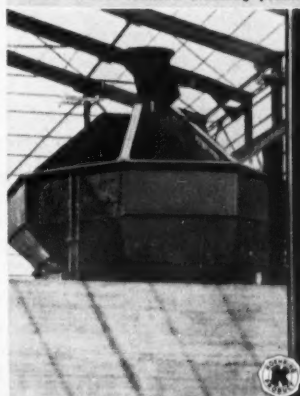
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- screens
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- blends

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OF OPERATION



▲ This modern Johnson bin and batching equipment increased production 25% for a large midwestern fertilizer manufacturer . . . and, at the same time, greatly reducing manpower requirements in the plant.

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Collecting hopper under screen feeds the pulverized material to a pivoted distributor which charges a sectional 5-compartment bin. Multiple-material batcher accurately weighs 5 (or more) fine-grained materials and discharges batch into mixing unit for final blending operation.

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☐ bucket elevators ☐ bins ☐ hoppers ☐ batchers ☐ clamshell buckets

SOIL

(Continued from page 26)

perature, time, and topography all play a part in soil nutrient content. Fertility tends to be greater where temperatures and rainfall are moderate. Soils in the South are relatively low in soil nutrients because of warm temperatures and heavy rainfall. In the cooler North and drier West, soils are generally more fertile. However, when rainfall is too low to support good grass growth some nutrients are again lacking.

Organic soils formed from the accumulation of plant residues are just as likely to lack nutrients as more common mineral soils. Crops grown on organic soils have no source of vital minerals, and so cannot supply

them to the soil.

The use of commercial fertilizers furnishes the primary method of re-building the supply of nutrients in soil, Dr. Parker believes. Liming materials and nitrogen-supplying legumes are also important.

Enough room for root growth is Dr. Parker's final essential soil management consideration. Lack of room may be caused by a high water table, hardpan, poor soil structure, or the presence of salts. In turn, extending root room may require drainage the removal of salts, and the addition of organic matter, lime, and nutrients below plow depth.

The use of deep-rooted legumes is probably the best way to extend root room, although this end can often be achieved by applying lime and nutrients

with attachments to chisels or other deep tillage implements. The extensive root systems of alfalfa and kudzu make these two legume crops ideal for the job of extending the rooting zone for subsequent crops. These crops add root residues and, as a result, a larger rooting zone is gradually developed and improved.

With such a diversity of soil types and conditions in the United States, Dr. Parker emphasizes that there is no one best way to maintain soil quality . . . to achieve good soil management. It is first necessary to understand the needs of the soil and then to use the various management methods that will cause the soil to produce good crop yields while retaining its own vitality.

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COMMERCIAL FERTILIZER

APFC Announces Convention Committee

Committeemen for the 1951 convention of the American Plant Food Council, which will be held at the Homestead Hotel, Hot Springs, Virginia, June 14-17, have been announced:

W. T. Wright, (Chairman) Vice President, F. S. Royster Guano Company, Norfolk Virginia; John V. Collis, President Federal Chemical Company, Louisville, Kentucky; J. A. Howell, President Virginia-Carolina Chemical Corp. Richmond, Virginia; A. F. Reed, Vice President Lion Oil Company, El Dorado, Arkansas; Paul Speer, Vice President United States Potash Company, New York, New York.

Refinery Waste Into Ammonium Sulphate

An improvement project which turns two refinery waste products into a chemical fertilizer has been completed at a cost of over \$250,000 at the General Petroleum Corporation's Torrance (Calif.) refinery.

The project involves a new process, conceived and developed by General Petroleum engineers and chemists upon which patent applications are pending. It produces eleven tons daily of ammonium sulfate.

The new process starts with waste refinery gases which are bubbled through sulfuric acid, producing a solution of ammonium sulfate. This liquid is piped to another vessel which turns it into crystal form by partial evaporation of the brine.

The resulting ammonium sulfate crystals are then separated by a centrifuge and are blown into a hopper from which trucks



Copy No. 850,000 of "Our Land and Its Care" is handed Walter Cummins (right), Freedom, Okla., National president of the Future Farmers of America by Dr. John R. Taylor, Jr., agronomist of the American Plant Food Council. Prepared by the Council in collaboration with the Agricultural Education Service, U. S. Office of Education, the 64-page, profusely illustrated publication is a story of our soil and how to keep it productive. "Our Land and Its Care" has been widely acclaimed by soil scientists, county agents, vocational teachers and others concerned with sound land management programs. Single copies may be obtained without cost by writing the American Plant Food Council, 910 17th Street, N. W., Washington 6, D. C. The presentation of the publication took place at a luncheon given by the Council honoring the national officers of the Future Farmers of America and officials of the Agricultural Education Service.

can be loaded by gravity. The crystals contain over 20.9 per cent nitrogen.

A unique feature of the process is the fact that instead of using pure sulfuric acid—a critical defense material currently in short supply—the unit uses acid sludge, another refinery waste which presents refineries with a tough and expensive disposal job.

The entire output of the new unit has been contracted for by the California Farm Bureau Federation, a cooperative buying organization of California farmers.

The new unit was engineered and constructed by The Fluor Corporation, Ltd., Los Angeles.

Gillis Succeeds Late

W. G. Krummrich at Monsanto

Following the death, February 27 of William G. Krummrich, John L. Gillis has been made general manager of the Organics Division of Monsanto Chemical, with headquarters in St. Louis. Charles H. Sommer Jr. has been made Merrimac Division general manager, to replace Mr. Gillis.

Mr. Gillis has been in charge at Merrimac since March 1949, and became a Monsanto vice president in May, 1950. Mr. Sommer has been with the concern since 1934, and became assistant general manager of the Organic Division in 1949.

PHOSPHATES IN SOILS AND FERTILIZERS FOR TRUCK AND CANNING CROPS

Whether you are growing truck, canning crops, field crops or forage crops, you cannot get away from phosphorus. Authorities in all countries are agreed that available phosphorus is one of the essential keystones of crop production. The problems associated with the use of phosphorus in crop production are numerous and complex. In recent years radioactive phosphorus has been widely employed in many research projects to help throw light on these baffling chemical and biological reactions of phosphorus. So that we do have at present a better insight to the behavior of this essential nutrient even though our knowledge is far from complete.

Before discussing these and other problems, let me review briefly some of the more general aspects of soil and fertilizer problems along the eastern seaboard. Among the various regions of the U.S.A., phosphorus is most deficient in the soils of the Coastal Plain which extends from Long Island down along the Atlantic seaboard to Florida and the Gulf States. This insufficiency of phosphorus existed even before the landing of the first colonists. It is something that we must ever keep in

By VINCENT SAUCHELLI

The Davison Chemical Corporation

Highlights of talk given to Maryland Vegetable Growers Association, in Baltimore, Md., January 8, 1951.

mind in our studies on crop production in this region.

First, one should know something about the forms in which phosphorus exists in the soil.

Forms of Soil Phosphorus

Of the four classes of soil phosphorus known, there are important suppliers of phosphorus to plants. These four groups comprise the phosphorus-supplying power of the soil. They are:

1. **Soluble phosphate:** This is an instantly available, soluble, form temporarily retained in fresh and actively decaying plant residues. Management practices determine the amount, which may vary from season to season even in the same soil. This form also represents the larger proportion of all water-soluble phosphorus of crop soils.

2. **Organic phosphorus:** This is present in old plant and animal residues chiefly in the phytins, phospholipids, and nucleic acids and is very slowly soluble. For example, the organic phosphorus of Prairie soils left behind after years of cropping is of this insoluble form. Some organic

phosphorus is present in the bodies of soil organisms. An acre-foot of soil may contain from 3 to 5 tons of soil organisms. Such a vast soil population can tie up considerable phosphorus in an insoluble form. In soils of humid regions the organic phosphorus compounds are relatively unimportant as a source of phosphorus to crops. These compounds are very difficultly soluble.

3. **Mineral phosphorus:** Two forms exist, primary and secondary. The primary is that derived from parent, rock material; the secondary is that found chiefly in the acid soils of humid regions. This type is extremely resistant to the solvent action of soil agencies. When moist root hairs "freeze" themselves to the surface of the soil mineral particles they seem to have the ability to extract some of the contained phosphorus by means of a concentration of carbonic acid which they excrete.

4. **Absorbed phosphorus:** This is the form in which the phosphate ion, PO_4 , is held on the surface of colloidal clay particles in much the same manner that calcium and potassium ions are held. It is called exchangeable phosphorus. At the point of contact with the root hair

the phosphate ion migrates from the clay to the root and it is only at such point that the phosphorus is available. The exchange may be of sufficient extent to satisfy all the phosphorus needs of the crop.

Inorganic Compounds

Most of the soil phosphorus is perhaps that found in the lower horizons where it exists in the form of some apatite. It is relatively unavailable. During the course of time, weathering and other agencies succeed in breaking it down and causing some of it to form secondary compounds of varying solubility. Some of the phosphorus is absorbed by plants and microorganisms and is converted into organic compounds which later are returned to the soil as residues.

The more common kinds of soil inorganic phosphorus compounds may be listed as follows:

a. The compounds with calcium, which comprise the water soluble mono — and dicalcium phosphates, and the relatively insoluble forms such as calcium hydroxyapatite and fluorapatite.

b. Iron and aluminum combinations with soluble phosphoric acid which form compounds that will vary in solubility depending upon the amount of phosphorus. Under neutral alkaline conditions these compounds will become more or less soluble.

c. Clay-lattice phosphorus. Phosphorus absorbed on the clay surface will vary in solubility, that which exists as "cation-exchange phosphate" being rather

highly available.

The pH of the soil reaction greatly influences the solubility of these inorganic phosphates. When the soil is limed it induces a change in the pH and this influences the availability of the inorganic phosphates. A pH of 6.5 to 7 favors availability because it is above the minimum range of solubility of iron and aluminum and below the minimum solubility of the calcium phosphates. The more clay in a soil, the more likely that organic matter will increase, because organic matter in the form of humic acid is held by the clay.

This brief, general review of the various forms of soil phosphorus will serve as a background for what follows.



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Soil Tests

Due to the manner in which plants feed, it is necessary that the root hairs actually contact soil particles in order to permit them to extract phosphorus. For this reason the ordinary quick soil test cannot give a true picture of the status of the soil phosphorus. Remember phosphorus, unlike nitrate nitrogen, does not move about with moisture. The advancing roots honeycomb the total soil mass but in their passage through the soil they do not contact the absorbed and the phosphorus of freshly decomposing organic material which lie in between the root passages. These masses of soil remain virtually untouched and intact to the end of the season. The soil test measures by means of the extractive solutions of the analyst the total available supply of soil phosphorus. There is a difference. This perhaps may help explain why only a small fraction of the total supply of soil phosphorus is removed by the growing crop in the one season. Yet, the soil test at the end of the season may show that the amount of phosphorus is as high then as at the beginning of the season. We must keep in mind that the amount of phosphorus accessible to the roots is proportional to the size of the root system. This system increases from almost zero at the seedling stage to as much as two miles as it spreads and extends through a cubic yard or so of soil. A normal corn plant can develop such an extensive root system under favorable conditions. In general, it may be said that it is not the total amount of phosphorus in



Dr. Paul W. Bachman, appointed director of research and development of Davison Chemical Corporation.

the soil that is important but rather the amount which is available to the plant when it must have it for its vital functions.

Seedling Stage Critical

The seedling stage is a very critical period for the plant. It is at this stage that the emerging rootlets contact only a few ounces or less of soil, the plant just having weaned itself from the phosphorus reserves of the seed. Unless a concentration of readily available phosphorus is present at this stage close to or in contact with the rootlets, severe phosphorus deficiency symptoms may appear. As the roots extend into the surrounding soil these symptoms may disappear, but some damage will already have been suffered by the plant. This critical period of any plant with respect to an accessible phosphorus supply cannot be overemphasized, because then the root system is too small to reach the soil supply of phosphorus which is known as a stationary nutrient. Plants stunted at seedling time seldom, if ever, recover later and the

yields may suffer even though starvation symptoms may have disappeared before harvest. Starter solutions and superphosphate sown with the seed have given good results primarily, I believe, because the phosphorus is placed as close as possible to the germinating seed or the seedling.

Seed-Forming Stage

The next critical period in the growth cycle is at the beginning of the reproductive stage when all the energies of the plant concentrate on producing seed. When the egg or ovule is fertilized and the seed begins to develop it needs phosphorus quickly and in generous amounts. If at this stage the plant has no reserves to draw upon the leaves yield their surplus, yellow, and die within a few days; however, the seed production may be seriously reduced.

The hunger sign symptoms associated with phosphorus deficiency—the purplish color on the underside of the leaves—reflect the situation inside the plant. About half the phosphorus in a growing plant is in the same, simple water-soluble form that it was when first absorbed by the rootlets. It is kept in that form as a reserve for the critical reproductive stage. At that time all the reserve phosphorus is mobilized into the young seeds. What is not needed for this purpose is used for keeping the plant alive and functioning. Should the soil phosphorus supply give out or its absorption slow down, the plant is forced to draw upon its mobile reserves or upon the phosphorus in the older leaf tissues. These older

leaves can be sacrificed and their phosphorus diverted to the younger, growing parts at the top of the plant.

Vegetable Crop Requirements

Vegetable crops are grown at a higher level of soil fertility than is necessary for most systems of farming and it is customary also to apply higher amounts of commercial fertilizer. Most successful vegetable growers are in fact horticulturists rather than "farmers"—that is, specialists. Since it is not usual to combine livestock with the vegetable growing enterprise, no animal manures are produced and reliance is entirely on commercial fertilizers. Waste crop materials, composts and green manure crops may be used to supply organic matter.

Soil conditions, however, are all too often highly artificial, since intensive continuous cropping seems to be the general rule. Little or no consideration is given to a rotation which will provide one or two years of a grass-legume sod to rest the land, build up fertility, and improve soil tilth.

It is generally conceded that vegetable growers have nutritional problems comprising two points: (a) to raise or adjust the fertility level to satisfy a particular cropping system; (b) to maintain this level and in addition supply the particular fertilizer requirements of the crops to be grown.

You are all familiar with the general requirements for success. It may be well to refresh

your memories: plenty of sunshine; the soil should be reasonably deep; subsoil free from "pan"—that is, free from that compacted layer at the plow sole; the surface should have good, crumb structure to favor good tilth; the drainage should be free all season, yet the soil should be so managed that the crop will not suffer much by drought, which means having enough organic matter to escape drying out and crusting over; the soil should permit easy access to air, since roots must have oxygen; the pH should be close to 7; and it is desirable to lime so as to have a small reserve of carbonate. About three to five per cent of organic matter should be present and a good portion should be in the active

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state of decomposition to release phosphorus and other nutrients; and the mineral nutrients should be adequate and readily accessible to the crop.

That, you may say, is a counsel of perfection—too good to be true. Perhaps; but many successful vegetable growers have achieved just that kind of soil and fertility status. Those specifications are taken from reports made by such growers.

Plant's Abilities to Get P_2O_5

Many investigators have studied the various abilities of different plants to get phosphoric acid (P_2O_5) from the soil supply. Great differences exist among crops in this respect. The Alabama Station has reported, for example, that kale will absorb about $\frac{1}{4}$ pound of P_2O_5 per acre, whereas a crop of sweet potatoes on the same soil type extracts about 19 pounds; lima beans absorbed 17 pounds of P_2O_5 per acre on a soil receiving no phosphate fertilization, whereas turnips, under the same conditions, extracted only six pounds and collards about 0.7 pound. The size of the root system was definitely a factor in the amount of phosphorus absorbed. The same Station has shown that crops vary in their ability to extract P_2O_5 from different soils. For example, on a Norfolk sandy soil, with no phosphate fertilization, turnips absorbed 15 pounds per acre of P_2O_5 , but under similar conditions on a Cecil loam soil, the same crop obtained only 0.7 pound. Carrots, however, absorbed seven pounds of P_2O_5 per acre on Norfolk sandy soil, but only three pounds on Cecil loam.

That is to say, carrots were able to absorb about half as much P_2O_5 on the Cecil loam as on the Norfolk sandy soil and only half as much as the turnips did on the Norfolk, but nearly four times as much as the turnips on the Cecil.

We can generalize these observations by saying that crops vary in their requirements of P_2O_5 ; in their feeding capacity for phosphorus; in their effi-

ency to absorb phosphorus; and in their efficiency to utilize phosphorus. These statements, I feel, need to be explained in detail in order to have their full meaning appreciated. Time does not permit, however, and I merely give them to indicate to you how complex the problem of phosphorus nutrition is and how careful one has to be in interpreting the results of field experiments.

V-C APPOINTS THREE, BASS-FRENCH-BARTON

Virginia-Carolina Chemical Corporation has announced the appointment of E. Y. Bass of Richmond, Va., as assistant to vice-president in the general sales office of its Fertilizer Division. At the same time, the firm announced that John L. French, formerly sales manager at Shreveport, La., is being transferred to Richmond as assistant general sales manager of the Fertilizer Division. W. D. Barton, Jr., has been named to succeed French as manager of the Shreveport office.

Mr. Bass first joined the V-C organization in 1910 in Durham, N. C., in the manufacturing department and was transferred to Richmond in 1913. A few years later he joined the company's sales department and was appointed assistant general sales manager in November, 1949.

A native of Byhalia, Miss., Mr. French first became associated with V-C in January, 1927, in the Memphis, Tenn., sales office. He served in various positions in that office, including assistant manager, and in August, 1946, was promoted to manager of the Shreveport office. At the time of his transfer to Richmond, he was serving as president of the Agricultural Council of Shreveport.

Mr. Barton began his career with V-C in 1944 as salesman in Texas. He was appointed assistant manager of the Shreveport office in June of last year. A native of Auburn, Ala., he is a graduate of Alabama Polytechnic Institute, where he was a member of Sigma Alpha Epsilon fraternity and the Blue Key Society, honorary leadership fraternity.

Bass



French



Barton



In the Field of

FARM CHEMICALS

EXISTING LAWS ARE ADEQUATE

Following is a digest of the testimony by State Governments and Members of the House of Agricultural Committee were instrumental in the development of what is now the Federal Insecticide, Fungicide and Rodenticide Act of 1947. Records of the hearings show that this Industry cooperated in every possible way. The industry was also active in writing the original Federal Insecticide Act of 1910, which was the first national pest control act.

NAC and members of the chemical industry are vitally interested in the health of the public. The thousands of employees in the Industry and the millions of farmers who use these chemicals are consumers of food products like everyone else. We all have a definite interest in the abundant production of a high quality, wholesome, food supply. Members of this Industry wish to cooperate in every way with this Select Committee and agencies of the government working to constantly improve the already high standards.

Attitude of Industry Toward Sound Legislation

It is evident from our observations of the proceedings to date, that one of the principal objectives of this investigation is to recommend legislation which would affect the distribution and use of pesticides.

The National Agricultural Chemicals Association and its members have always supported sound, constructive legislation in the public interest. In the early 1940's this Association felt that the Insecticide Act of 1910 did not offer adequate protection to the users of pesticides. As a result, we became active in advocating stricter legislation.

The United States Department of Agriculture and the Industry, in cooperation with the Council of

To assure proper handling of materials not in interstate commerce and under the provisions of the Federal Act, the Council of State Governments, the U.S.D.A., many state regulatory officials, the National Association of Commissioners, Secretaries and Directors of Agriculture, and the Industry cooperated in the development of a Uniform State Insecticide, Fungicide and Rodenticide Act. During this entire period the Association and its members were extremely active in advocating and supporting this legislation.

The Industry is supporting the introduction of this Uniform State Law in all states. To date, state laws which control the sale of pesticides are in effect in 39 states.

At the present time, this Association is actively supporting a Uniform Custom Applicators Law, also drafted by the Council of State Governments and other interested groups to insure safe application of these products by air and otherwise.

The Necessity for the Use of Pesticides

We must recognize the fact that

these materials are not used by the grower through desire but out of dire necessity. No farmer is purchasing hundreds of dollars worth of pesticides to produce a crop unless they are necessary.

Dr. F. C. Bishopp, Assistant Chief, Bureau of Entomology and Plant Quarantine, USDA, testifying in the current Residue Tolerance Proceedings on Necessity for Use of Pesticides, said that, "fruits and vegetables would be unmarketable without the use of insecticides, whether the standard is set by consumers, market graders, or inspectors of the Food and Drug Administration. Without the use of insecticides, many products now enjoyed by the American public would no longer be found in our markets. The fruits and vegetables of high quality now reaching the consumer are not accidental. They are available by virtue of carefully planned and executed control of insect pests and plant diseases through the use of insecticides and fungicides. If restrictions are placed against the use of some of these materials, and inferior ones are substituted because they might be considered safer, the costs of production will increase materially, the consumer will be forced to pay more, and the standard of living in this country will be lowered," Dr. Bishopp concluded.

This is but one of the many examples . . . showing the necessity of and values received from pesticides. Further evidence documenting the necessity for use of these pesticides together with their economic importance with respect to fresh fruits and vegetables production has been entered into the record of the current residue Tolerance Hearings held by the Food and Drug Administration. Over five thousand pages of testimony by 143 witnesses along with 1200 exhibits and affidavits were substantially devoted to supporting the necessity for use of pesticides on fresh fruits and vegetables. With the exception of several recesses, this phase of hearings ran from January 17 through April 27.

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Evidence was also presented covering residues and Industry and Government toxicological research. In the transcripts of these hearings there is a compilation of federal, state, Industry and private research which represents all of the current available knowledge on this subject.

In all, there were over 8000 pages of testimony presented by 246 witnesses, among whom were the nation's leading scientists, outstanding growers and major farm organization representatives. NAC abstracted the proceedings of these hearings.

Existing Legislation Affords Adequate Protection

We want to emphasize that pesticides are not sold without legislative control. I know of no other industry which has to comply with more laws and regulations in order to sell their products.

In addition to the Federal and State laws covering the sale of pesticides, we must also comply with regulations issued by the administrative agencies of the Federal and

State Governments.

Under the present Food, Drug and Cosmetic Act, the Food and Drug Administration has full authority to seize any food which, in their opinion, contains a poison or deleterious residue which may be injurious to health. The law also provides for the establishment of residue tolerances and in our opinion the residue problem on fresh fruits and vegetables will shortly be determined by the Food and Drug Administration in accordance with evidence submitted at the recent hearings. There is also authority in the law to establish tolerances on all other products. As a part of this authority, the Administrator can prohibit the use of any product which he feels is unsafe in or on food.

We are also advised that as a practical matter the enforcement officials for the Department of Agriculture informally clear their information with the Food and Drug Administration before a product is approved for registration and sale.

Industry is fully aware of its responsibilities. Before a product is offered for sale, thorough research is conducted.

Industry is conducting thorough research on entomology, plant pathology and toxicology pertaining to effect on both the user and consumer. Reports to NAC from two-thirds of the basic producers show that during the past 10 to 12 years, these 20 companies have developed 102 chemicals which could be used as insecticides. In order to find these potential insecticides, 32,216 chemicals were screened. Annual expenditures for research of these companies totals \$3,895,000. They have 215 research projects in cooperation with agricultural colleges, health institutions such as the Kettering Institute and the Wisconsin Foundation. Each of these companies supports an educational program designed to encourage the proper and safe use of agricultural chemicals by the ultimate consumer. These companies report that the length of time lapsing between the development of a

product and its sale runs from 3 to 5 years.

Proposals for New Legislation

It has been proposed during these hearings that the problem can be solved by making chemicals used in or on food products subject to a provision similar to the "new drug section" of the existing Food, Drug and Cosmetic Act. Without taking direct issue at this time with this proposal, there is no such simple cure for the problem. It is impossible to regulate the drug industry, the use of chemicals in or on foods, the pesticide industry, the fertilizer industry and possibly others, by a single statute which fails to recognize the individual problems of each.

The proposal is also indefinite and we do not believe the extent and ramifications are fully appreciated.

However if we understand correctly that a new section similar to the new drug revision is to be introduced to cover chemicals, and if the same pattern is followed, it would not be a mere regulation of pesticides but a complete regulation of practically all foods, and no food product or modification of a food product could be sold without approval of the Food & Drug Administration.

Such a provision would not only retard the use of basic pesticide chemicals but would prevent any modification of formula to meet changing growing conditions in various parts of the country without permission of the Food and Drug Administration.

The proposal would also, in our opinion, definitely handicap and retard research in the field of pesticides which can now barely keep one jump ahead of the insects. While Industry fully recognizes the im-



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The Southern Lead Burning Company, Atlanta, Georgia offers to the acid industry Solid Hard Lead Fans from 25" wheel diameter to 50" diameter.

The principal feature of this type fan is that 1/2" to 1" thick rolled sheets of antimonial lead are used with all seams burned through, making it a solid piece of lead free from any sand holes and having a greater density than fan casings cast from hard lead. Impellers for the smaller sizes are made from antimonial lead plates. Impellers for larger size are made from antimonial lead plates or steel plates with a 3/16" homogeneous lead coating.

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Fans can be furnished with variable speed drives.

portance of advanced testing of all chemicals which are to be used as pesticides, as demonstrated by current research programs of the Industry, there is a practical limitation which must be recognized such as the number of chemicals screened for pest control use, the necessity of conducting wide and varied tests on other scientific problems involved, and the fact that there are neither research facilities or trained personnel available to carry out such an exhaustive program as proposed by some of the scientific witnesses. It would be impossible to complete all of the research indicated as essentially the Food and Drug Administration.

The proposal also establishes con-

flicting control of pesticides in two Federal agencies. Such a procedure is neither practical nor desirable, either from the viewpoint of the Industry or of the public.

The proposed procedure could also establish dictatorial control on all research on agricultural chemicals. A small number of men in a bureau could be the sole judge of all the research done by competent scientists, both in Industry and in other established scientific institutions. The only appeal would be to the courts which is not commercially practical except in extreme cases and we do not believe that such government control is in the best interest of either the farmer or of the public.

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EXPORT ORDERS SOLICITED

Proposals by Industry For Simplifying Procedure

We are convinced that no new legislation is necessary in order to protect the public health. If on the other hand, the Committee is of the opinion that there is need for facilitating the enforcement of the present laws and regulations and encouraging original research and development of new products, then consideration might be given to simplification of the present residue tolerance procedure to make it more

rapid, less expensive and more realistic.

Moreover, we are convinced that pesticides should be treated in a category separate from fertilizers, drugs and other chemical products.

We are now in a critical defense position. Already many of the raw materials used by the pesticide industry are in short supply. Unless the American farmer has available an adequate supply and a wide range of pest control chemicals it will be impossible to produce the food and fiber requirements for defense production.

SOME INSECTICIDES MAKE SOIL TOXIC

How frequently and for how long some of the new chemical insecticides can be applied to crop land without damaging crop yields, is the serious question that USDA plant pathologist Arthur C. Foster posed last month before the Southern Agricultural Workers Association meeting in Memphis.

In five years of research investigations at the Department's Plant Industry Station, Beltsville, Md., working with a wide range of dosages including some excessive dosages, Foster has found that some of the new insecticides remain surprisingly toxic in the soil, while others do not. One hundred pounds of DDT per acre or more applied to soil in 1945 has lost little of its toxic effect to date. Smaller amounts applied to crops as needed to control insects accumulate in the soil over the years.

Tests with a number of different field and truck garden crops showed, too, that a large proportion of them are in some

degree sensitive to large doses of insecticides mixed in the soil. All but three of 17 garden and field crops grown in greenhouse trials showed some sensitivity to DDT and seven were classed as highly sensitive. Growth of these crops was reduced as repeated heavy dosages accumulated in the soil or as increasingly large amounts were applied.

These research findings led Foster to question the heavy, continuous use on the same land of the more stable insecticides, especially DDT and technical BHC. He emphasized the importance of avoiding careless, excessive, or improper use, and went on to suggest the desirability of looking for effective substitutes.

DDT, the first and most widely used of the post-war insecticides, was studied more extensively than others. It was found that heavy applications of DDT (about 30 pounds per acre per year) could build up soil ac-

cumulations in 3 to 5 years that would damage the more sensitive crops. Growth of rye in soil from under peach trees that were sprayed 3 years with DDT and 1 year with technical BHC, was reduced about 30 percent by the toxic build-up of insecticide residues in the soil. Some soils that get applications of about 10 pounds of DDT per acre per year may become harmful to sensitive crops within 5 to 10 years.

Limited trials showed technical BHC to be less stable than DDT, but because of its high toxicity to plants in the soil, it is capable of forming damaging accumulations if used frequently at heavy rates. Toxaphene and parathion, however, were found to be so unstable in the soil that they are not expected to accumulate there to a harmful degree following recommended use.

Tests in mineral and muck soils common to eastern United States showed that DDT could reach harmful levels in either type, although much more could be applied to the muck without injury to crops, than was true for the mineral soils.

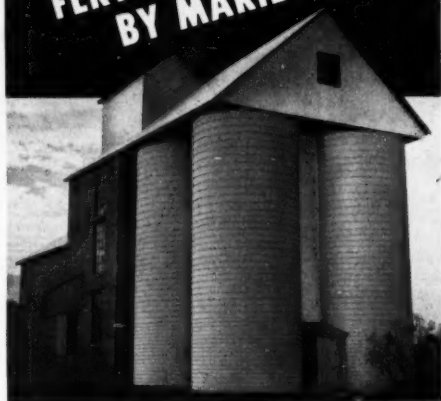
The Pennsylvania Salt Manufacturing Company's new plant for formulating insecticide concentrates and finished insecticide products at Montgomery, Alabama, has been completed and is now in production, the company announced.

The plant, Pensalt's first in the Southeast, also includes a new district sales office of the Agricultural Chemicals Department to serve southeastern agriculture. J. Drake Watson is district sales manager and R. O. White is plant superintendent.

Production equipment is designed
(Continued on page 52)

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Around the Map

ALABAMA

Mathieson Chemical Corporation has been chartered to do business in Mobile by the Alabama Secretary of State. The concern operates 16 plants throughout the U.S.

CALIFORNIA

General Petroleum Corporation has completed a \$250,000 project at its Torrance refinery which produces eleven daily tons of ammonium sulfate, by a new process upon which patent applications are pending. The new unit was engineered and constructed by **The Fluor Corporation, Ltd.**, Los Angeles.

FLORIDA

Fertilizer concerns around Tampa kicked in a hundred dollars each for the March of Dimes. They were **Gulf, Lyons, Peninsular, Superior and West Coast**. The industry chairman was **Fred Woods**.

American Machinery Corporation, Orlando, have adapted the fertilizer application equipment to supply the government with a decontaminating unit for war defense. The outfit spreads a neutralizer over the ground, via rotary fans and is particularly effective with mustard, lewisite and other gases which cling to the earth, according to **W. R. Verigan** of the concern. This is a modernized version of a conversion unit made by the company in World War II, and used by Americans and British.

Virginia-Carolina Chemical Corp. has made possible the first public bathing beach at Bartow by agreeing to deed to the city a 285-acre tract which includes three phosphate pools. Local authorities were enthusiastic in the praise they heaped on VC executives **H. L. Pasco, W. P. Menear and W. Ray Cullop**, who secured headquarters consent to the transaction.

General Mills farm division, Miami, suffered a \$50,000 loss when fire destroyed fertilizer and feed in a warehouse there.

Cornet Phosphate is moving mining operations from Alafia River to Saddle Creek, northwest of Lakeland, according to General Superintendent **W. H. Taylor**. The concern produces some 600,000 tons a year.

GEORGIA

The Tennessee Corporation has built a modern dry-mixing plant of 15,000 tons annual capacity at Gainesville. It is the last word in fertilizer producing equipment and labor-saving devices. **Dr. J. K. Plummer** is general manager; **W. D. Barton** is sales manager.

INDIANA

D&K Fertilizer's plant, West Peru, was destroyed in a \$500,000 fire the middle of last month. Lack of a close-by hydrant forced firemen to drain water from a nearby gravel pit.

A firm, still unnamed, has been formed in Tuscola to distribute anhydrous ammonia. Officers are **Claude Ware**, president; **S. L. Victor**, vice president; **Perry C. Stackhouse**, secretary-treasurer. The concern will do contract application work, and is building two 30,000 gallon storage tanks.

KENTUCKY

Burley-Belt Plant Food Works, Lexington, has established a plant with an annual capacity of 20,000 tons. One of the most modern of plants, it features to customers its ability to use newer and better materials not being used in older plants. The building is 264 x 80 feet, equipped with a one-ton Stedman unit, an overhead 100 foot Shuttle 24 inch belt conveyor, which feeds bins while manufacturing and two eight-ton hoppers while shipping. A St Regis packer, model 160-FB handles bagging. The plant was established by **R. F. Terhune**, formerly interested in **Kentucky Fertilizer Works**, Winchester, and his partner **A. N. Peck**.

LOUISIANA

The Southern Liquid Fertilizer Company, Inc., New Iberia, has been incorporated with a capital stock of \$100,000.

Smith-Douglass lost \$35,000 worth of property recently when a fire swept through their garage at Bossier City, destroying six tractors, used in plant operations.

MASSACHUSETTS

Monsanto Chemical's Boston plant crew set a new local safety record of 1,522,000 man-hours without a lost time accident. The record was broken the morning of February 6, and is the longest accident-free period in the history of this nearly 100-year old plant, according to **Russell L. Miller**, manager. The Company record is held by the St. Louis plant, with 2,750,000 man-hours.

MISSISSIPPI

The Mississippi Farm Bureau Federation has announced it will build a \$100,000 fertilizer plant at Macon this year from the profits of its Cedar Bluff lime plant. Construction will begin at once, according to president **Boswell Stevens**.

MISSOURI

Northeast Missouri Fertilizer Service Co., Shelbyville, has been established to handle rock phosphate, mixed fertilizer, and anhydrous ammonia. **B. F. Broughton** and **George Campbell** head the concern.

NEVADA

Randall Mills Corporation, who have a lease on the Las Vegas bat cave, are grateful to the A-Bomb for blasting down a wall in their cave, uncovering another cave which contains perhaps half a billion dollars worth of additional bat-guano. **Adolph Schleicher** heads the concern.

NEW YORK

Directors of the **Anglo-Chilean Nitrate Corporation** and the **Lautaro Nitrate Company** have reached agreement on the principal terms of a proposed amalgamation, both companies announced jointly. The agreement is subject to approval of the security holders of both companies and also any necessary Governmental consents under English and Chilean law.

Under the terms, Anglo-Chilean would acquire the assets of Lautaro through an exchange of shares. Anglo-Chilean would assume all the obligations of Lautaro, including its two outstanding issues of sterling debentures and its outstanding issues of United States dollar bonds, with some minor modifications. The merger would be effective on July 1, 1950.

The terms provide that Class A shares of Anglo-Chilean be converted into a nominal value \$2.40 each United States currency, and that Lautaro A ordinary share-holders

exchange their shares for Anglo-Chilean on a share-for-share basis. Lautaro B shareholders also would receive new Class B shares of Anglo-Chilean on a share-for-share basis.

TENNESSEE

Tennessee Farmer's Cooperative February 15th dedicated the first farmer-owned fertilizer plant in Tennessee, during the sixth annual meeting of that Cooperative. **F. V. Browder**, president, unveiled the bronze marker during the official opening of the \$330,000 plant near LaVergne. More than 800 stockholders attended the 2-day meeting, according to **J. B. Jones**, general manager of the association.

TEXAS

Hy-Yield Fertilizer Co., Bonham, has bought the **Sunnyland Chemical Co.** and the **Commerce Oil Mill** both at Commerce and the **Mount Pleasant Oil Mill**, Mount Pleasant, to expand its production of fer-

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tilizer and cotton insecticides. **The Hy-Yield Chemical Co.** will handle the latter products. **Harold Dean Smith** is president, **Harold J. Baker** is in charge at Commerce, **Paul Lennier** at Mount Pleasant.

* * *

Casner Chemical Co., El Paso, have announced a free soil-testing service for farmers in the area. They have installed a complete **La Motte** Soil Testing Laboratory.

UTAH

Monsanto Chemical Co. has an option to buy part of the phosphate deposits of the **Humphreys Phosphate Co.**, near Vernal, and will explore these and other areas before deciding on manufacturing facilities, according to General Manager **John K. Christian** of their Phosphate Division.

VIRGINIA

Virginia-Carolina, Richmond, publish a snappy house organ known as **V-C News** with **R. Clifton Long** as editor. It is only recently we have had a chance to observe this paper, which is high in editorial excellence. Of course, the book is highly personal, and very much concerned with facts about V-C people and personalities.

AUSTRALIA

Hopes that fabulous deposits of sulphur in New Guinea would help relieve the shortage of that commodity have been blasted by thorough research. **Ian McDougall**, industrial chemist, declares the deposits too small to be profitable to a large company.

New Zealand's need of sulphur has caused an immediate crisis, and bulking-up of available superphosphate with ground rock or lime are being considered. The alternative is rationing.

Western Australia is also faced with the possibility that its agricultural development, predicated on an expected sharp increase in fertilizer production, will be complicated by the world-wide shortage.

Potash Company of America General Sales Office To Washington

George E. Pettit, Vice President and General Sales Manager of the Potash Company of America, has announced that on April 15th, the General Sales Office of the company will be located in Washington, D. C. Spacious quarters have been leased in the newly erected, air-conditioned **Cafritz Building** at 1625 Eye Street, N.W.

The present offices at 50 Broadway, New York, which the company has occupied for approximately ten years, will be given up. **John W. Hall**, Northern Regional Sales Manager, and **Paul C. Ausley**, Southern Regional Sales Manager, will make their headquarters at the new Washington offices. Most of the New York office personnel will also be transferred.

GUATEMALA

Exploitation of large bat guano deposits found in caves near **Izabal** and **Escuintal**, discovered while surveying the caverns as a tourist attraction. Deposits are as deep as 12 feet.

ICELAND

An ECA-financed plant at **Reykjavik** will produce nitrogenous fertilizers. Proposal has been approved to make 6000 metric tons annually of ammonia, the hydrogen to come from electrolysis of water, then nitrogen from fractionation of liquid air.

SOUTH AMERICA

Chemical Construction Corporation is building at **Columbia** a \$1,500,000 plant which permits the recovery of elemental sulfur at present price levels from surface deposits, by grinding, coalescing, flotation and filtration.

GRASSLANDS

(Continued from page 30)

interested in and serving agriculture. The fullest possible support and participation is needed by all who can contribute to this objective.

Here in the Association of Southern Agricultural Workers are arrayed all the public and private organizations which can bring valuable contributions to the grasslands program—each in its own field of work. These contributions can in a large measure assure the success of the program here in the Southern States. Speaking primarily for the Department and, I am sure, for the Grasslands Program Steering Committee, I would like to express at this time our desire for your continuing support. Indeed, I am sure that we can look to all of you for the assistance we require to put this program in high gear so that it can go forward swiftly and surely to our objectives. Let us keep foremost in mind the fact that grasslands are good for the South.

Under all these circumstances, the grasslands program is sound. Our decision to push forward with it in concert with the Land-Grant Colleges will serve the national interest. We can count upon rich returns in which the participating farmers, the people, and the Nation will share—in the immediate future and in the uncertain years which are further ahead. In the reservoir of fertility created by improved grasslands, the Nation will have on hand ready for use the productive capacity to increase our supplies of grain, oilseed crops, and cotton with the assurance of larger yields. For farmers the value of the grasslands program can be translated into lower production costs and higher net income. At the same time and by the same token, consumers can reasonably expect to have the opportunity to improve their diets. The certainty of these benefits and their lasting value should encourage us to go forward with our grasslands work.



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SAVANNAH

NEW ORLEANS

HOUSTON

Sturtevant Issues Interesting Literature

Two pieces of literature from Sturtevant Mill Co., Dorchester, Boston 22, Massachusetts have come to this office recently. One is a miniature catalog of their products, reduced to pocket size, and yet giving essential data, with pictures of the entire line of crushing, grinding, separating, elevating, conveying and mixing machines.

The other is a full size bulletin, No. 089. Concisely as to words and clearly as to illustrations, it describes the Sturtevant Den and Excavator, a unit which measures, combines, and mixes sulphuric acid and phosphate rock dust; accumulates the resulting super in a carbox den; removes the fumes; dissipates excess moisture; aerates and

shaves the block of super, fanning it into an elevator which carries fine granular result to car or storage. And all this with just two operators. Write for your copy.

Lion Oil Book Helps Visitors

Hundreds of visitors each year go to see the Lion Oil Company's chemical plant and refinery at El Dorado, Arkansas, one of the most modern industrial installations in the U.S. To make it more interesting to these visitors, and to help them get more out of their visits, the company has published a book bearing the title "Looking at Lion Oil Company" which gives a host of information compactly and in simple terms for the un-

technical, as well as more scientific language for the technically minded.

The books, given to visitors, have recently been distributed also to Lion Oil personnel, and at the same time a copy was sent to Commercial Fertilizer.

Aries' New Statistical Unit

Dr. Robert S. Aries, President of R. S. Aries & Associates, has announced the formation of the new statistical engineering division. Under the direction of Frank M. Culpepper, Dr. David B. Hertz and Dr. Sebastian B. Littauer, this division will specialize in the application of statistical methods to the process industries.

DAVISON ANNOUNCES GRANULATION PROCESS AT PERRY PLANT

Limited production of homogeneous granulated complete fertilizers by an improved process will shortly be started by The Davison Chemical Corporation at its Perry, Iowa, plant, it was announced recently by W. N. Watmough, Jr., vice president in charge of the company's Mixed Fertilizer Division.

Production of granulated complete fertilizers in this form marks further diversification by Davison. The company in recent years has broadened its interests in industrial chemicals while continuing its expansion in fertilizers.

The announcement made it clear that the new process was still on a test and development basis; that its extension to other plants was well in the future, and that prospective production, limited as to grades or formulas as well as quantities, was completely sold out for the season.

In homogeneous granulated complete fertilizers, the announcement explained, fertilizing materials are combined in

small pellets, or granules, each of which contains the ingredients in the proper proportion. In this form the fertilizer feeds freely and evenly from the farmers' machinery, and can be applied without loss from blowing, even by the new method of aircraft distribution. As it resists caking in storage, it can be produced and stored in the season of minimum demand for fertilizer. In the soil the granulated product is less subject to "fixation" of the phosphate, or chemical change to a relatively unavailable form, than is the pulverized product.

Although granulated superphosphate has commanded a large market here, granulated complete fertilizer has not been available on a comparable scale, Mr. Watmough pointed out. Its adoption has been more rapid abroad, and more than three-fourths of the complete fertilizers produced in Great Britain are in this form. Similar approval of the product here has been predicted by agronomists.

Dutch Engineers Study Bemis Mills

Two textile engineers from the Netherlands, visiting this country for eight months to study American textile production methods, are guests of the Bemis Bro. Bag Co. at two of its cotton mills in Bemiston, Alabama and Bemis, Tennessee.

The two engineers are graduates of the textile engineering college at Enschede, the Netherlands, and were selected for this advanced study because of their outstanding qualifications in technical knowledge, personality, and ability to get along with workmen.

Expressing amazement at the number of factory employees owning cars, the visitors say that workers in their country consider this statement as propaganda when hearing of it; adding, "The people in all Europe envy the people in the United States. It would be a paradise if we could all live as you live here. In comparison with countries in Europe, everyone in America is rich, having everything they could want."

PLANTERS FERTILIZER & PHOSPHATE COMPANY

Manufacturers of

Sulphuric Acid, Superphosphate, Ammoniated Superphosphate Base,
Mixed Goods.

CHARLESTON, S. C.
Box 865

Personals

Alethia Ullrich Leyhe, Atlanta Office Supervisor for **The Barrett Division** of **Allied Chemical & Dye Corp.**, was guest of honor at a dinner given by other staff members of the Atlanta District Office on March 1 celebrating her 20th anniversary with the company. As a token of her associates, esteem, a combination radio and record player was presented Mrs. Leyhe.

* * *

W. H. Raymond has been made assistant manager of the fertilizer division of **Archer Grain Co.**, Houston, Texas.

* * *

Joseph LaVecchia, who started with **Union Special Machine Co.** as an apprentice mechanic in July 1941 is now a representative in its New York office, working the Long Island territory. **John W. McLain** of their San Francisco office has retired after fifty years with the company.

* * *

John R. Roche, who until last November had represented **Mente & Co., Inc.**, New Orleans bag manufacturers has rejoined the company and will take over his former territory—Nebraska-Kansas-West Missouri—with Kansas City as headquarters.

* * *

R. L. Hockley, vice-president and a director of **Davison Chemical**, has been made a director of the Safe Deposit and Trust Company, Baltimore.

* * *

John B. Hutson has just been

named an assistant for agriculture in the Office of Price Stabilization and will serve as director of the Food and Restaurant Division of OPS. Mr. Hutson, formerly Under Secretary of Agriculture, resigned from USDA to assist in the organization of the Secretariat of the United Nations Organization. Since 1947 he has served as President of Tobacco Associates, Inc.

* * *

Cedric G. Gran, of the Little Rock, Arkansas, office of the Mathieson Chemical Corporation, and formerly in OPA in charge of fertilizer prices, has just been appointed Consultant in the Food Division and is in charge of price stabilization work as to fertilizers, insecticides and fungicides of the OPS. He was recently on the staff of APFC.

* * *

Frederic Arden, of the Mathieson Chemical Corporation, Baltimore, Maryland, and formerly Chief, Chemicals and Drugs Section, Department of Commerce, has been appointed as Chief of the Inorganic Chemicals Section of the National Production Authority. He is much concerned over the sulfur and sulfuric acid emergency and is making an intensive study of the situation.

* * *

Marion J. Funchess, for many years dean of the **School of Agriculture** and director of the **Agricultural Experiment Station** system of Alabama, has retired and now holds the post of dean emeritus. He has been succeeded by **Edwin V. Smith**.



Carl A. Miller who has been made a director of Arkell and Smiths, paper bag manufacturers. He is Senior Vice President of the Irving Trust Company.



Sydney T. Ellis, who has been made assistant to the President of Commercial Solvents, J. Albert Woods. His principal responsibility will be in connection with the company's development program.



R. J. Stevens who has been made a special representative of Chase Bag Company's Chicago general sales office.

Personnel changes have been made in the state of Georgia which include the following:

Dr. C. C. Murray, formerly director of the experiment station at Experiment, Ga., has been named Dean of the College of Agriculture, Director of the Experiment Station and the Coastal Plain Experiment Station at Tifton, Ga., as well as Director of Extension.

Dr. F. F. Cowart, formerly head of the Department of Horticulture at the Georgia Experiment Station, is now associate director of that station.

George H. King, formerly director of the Georgia Coastal Plain Experiment Station, is now Director of Research in charge of all research at both experiment stations and the College of Agriculture.

Dr. Frank King, formerly professor in the Department of Agriculture Economics at the University of Georgia, is the new associate director of the Coastal Plain Station.

Harold Loden, of the University of Georgia agronomy department, is now resident director in charge of agricultural research at the College of Agriculture.

Paul Chapman continues as associate dean of the Agricultural College in charge of teaching.

Dr. G. W. Burton is chairman of the Agronomy Division which includes all agronomy work throughout the University system.

PROMINENT OF ADVERTISERS QUOTED IN INDUSTRIAL MARKETING MAGAZINE

In the February issue of Industrial Marketing, a magazine devoted entirely to helping solve the problems of selling equipment, supplies, material, machinery and the like to industrial users, there appeared a Forum on the opinions of top management men in answer to a set of questions posed by the magazine: "Are you convinced that the industrial advertising of your company is producing results?" "Is there any way you can get specific proof of results?" "Do you expect results in terms of sales and inquiries,"

G. A. Gilbertson, vice-president of Frank G. Hough Co., makers of the Payloader, so familiar to readers of Commercial Fertilizer, said: "Any investment . . . whether it be for production, sales or other departmental functions, should be evaluated by the results . . . We realize that some advertising results are necessarily intangible but we have received enough positive proof of its effectiveness to be firm believers in its value to our company."

Hobart C. Ramsey, president

of Worthington Pump & Machinery Corp., another familiar to readers of these pages, agrees that "Properly conceived and executed, industrial advertising does produce results . . . We are confident that the long range results of our past advertising program has made Worthington Pump & Machinery Corporation's products and name better and more favorably known with each passing year."

FARM CHEMICALS

(Continued from page 44)
to manufacture either concentrates of insecticide formulations for other blenders or finished insecticide products ready for the grower's use. Products will include a complete line of recommended insecticides for use on cotton, peanuts, soybeans, potatoes and truck crops, and for livestock.

Neely Turner, Connecticut AES entomologist, has gone to England where for six months he will be exchange scientist on the staff of the Rothamsted Experimental Station, devoting his time to the field of insecticides. Returning to England, after a year as exchange scientist in Connecticut, Dr. A. H. McIntosh will sail with Mr. Turner to resume his Rothamsted post.

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OR LETTER**



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FERTILIZER AND FEED MATERIALS
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MARKETS

Record 1950 Production Seems Sure

As in most of the chemical and industrial fields, superphosphate production continues to drive toward new highs for 1950. November production (18% APA basis) was the highest it has been for any November during the past 10 years. During November, 1950, 69,000 more tons of 18% super were produced than the November output for 1943 and 1944 combined.

The swing toward concentrates continued. 7,357 more tons of 45% superphosphate were produced in November, 1950, than during November, 1949. Production of this commodity for the first 11 months of 1950 exceeded production for the corresponding period of 1949 by 133,042 tons.

Old Tax Tag Sales Record Broken

Tax tag sales during the year 1950 set a record for the 14 reporting states. 1950 sales of tax tags represented 10,877,974 tons of fertilizer compared to 9,808,514 tons for the preceding year.

Not only was a new high recorded for last year, but tax tag sales in all the 11 reporting States zoomed 68 percent, from 797,419 tons to 1,173,089 tons, for the month of January 1951 compared to the same period of 1950.

ORGANICS: Last sales of domestic Nitrogenous Tankage were made at \$4.50 to \$5.00 per unit of Ammonia in bulk f.o.b. origin, but producers are presently withdrawn from the market. Other Organics for Fertilizer use are in firm market position.

CASTOR POMACE: Current quotations for domestic production are at \$5.50 per unit of Ammonia in bags, f.o.b. North Eastern production points for material testing min-

U. S. SUPERPHOSPHATE SUMMARIES, in Thousands of Short Tons Based on Data for 199 Plants, Representing Total U. S. Production Compiled from Reports Submitted to The National Fertilizer Association and a Summary of Reports Submitted to the Bureau of the Census

	November 1950			Total, 18% APA Basis		Conc. (45% APA)		
	Normal 18% APA Basis	Wet Base 18% APA Basis	Conc. 45% APA Basis	November 1950	November 1949	Jan.-Nov. 1950	Jan.-Nov. 1949	Jan.-Nov. 1950
Stocks, first of period	982	12.6	59	1,142	1,260	1,421	1,408	104
Production	794	5.5	55	936	851	9,923	9,672	634
Received from other plants	13	—	—	13	9	91	84	—
Book adjustments	5	—	—	5	—	63	43	—
Total supply	1,794	18.1	113	2,096	2,117	11,498	11,207	735
Shipments	459	3.4	47	582	498	6,237	5,695	657
Used in reporting plants	380	.4	1	382	308	4,133	4,200	13
Total disposition	839	3.8	48	964	806	10,370	9,895	670
Stocks, end of period	955	14.3	65	1,132	1,311	1,128	1,312	65

FERTILIZER TAX TAG SALES AND REPORTED SHIPMENTS¹ (In Equivalent Short Tons) Compiled by The National Fertilizer Association

STATE	January		January-December		July-December	
	1951	1950	1950	1949	1950-51	1949-50
Virginia	1/	1/	670,330	682,415	153,548	188,428
N. Carolina	1/	1/	1,816,079	1,518,457	391,285	257,571
S. Carolina	188,934	157,950	1,013,826	962,716	308,211	200,144
Georgia	256,009	149,329	1,235,758	1,233,635	279,453	217,213
Florida	153,475	122,023	1,097,368	984,092	527,220	468,629
Alabama	56,425	41,839	1,051,309	1,042,369	227,014	165,517
Tennessee	21,132	16,084	492,256	461,775	119,518	101,043
Arkansas	34,994	16,915	366,063	334,595	75,933	67,418
Louisiana	43,161	19,631	278,708	241,589	74,227	56,444
Texas	61,480	40,354	587,639	505,497	256,109	215,649
Oklahoma	1/	1/	143,920	125,528	55,608	54,518
TOTAL SOUTH	815,610	564,125	8,753,256	8,092,668	2,473,126	1,992,574
Indiana	127,610	98,375	961,653	770,739	496,164	405,419
Kentucky	94,782	57,415	607,170	490,716	207,763	166,047
Missouri	135,087	77,504	555,895	454,391	263,180	167,984
TOTAL MIDWEST	357,479	233,294	2,124,718	1,715,846	967,107	739,450
GRAND TOTAL	1,173,089	797,419	10,877,974	9,808,514	3,440,233	2,732,024

¹ The State of Virginia will report quarterly effective January 1, 1951. Oklahoma and North Carolina report tax tag sales 30 days after the end of current month. Oklahoma and North Carolina tag sales for December 1950 represent 6,490 and 107,335 tons respectively, compared to 3,330 and 68,473 tons during December 1949.

imum 5.75% Ammonia. Supplies are very limited.

DRIED GROUND BLOOD: The Chicago market is around \$9.25 to \$9.50 per unit of Ammonia in bulk, delivered the Chicago area. The New York market is at \$9.50.

POTASH: Due to the recent tie-

up of the Railroads by the Strike, the dislocation of shipping schedules from the Potash mines was quite serious. Prices continue unchanged and demand heavy.

GROUND COTTON BURASH
Some supplies for prompt and spring shipment are available and some

producers are furnishing higher analysis material than formerly, although it is offered testing 30/40% K_2O Potash. This material is shipped in bulk primarily and is largely in the form of Carbonate of Potash.

PHOSPHATE ROCK: Movement continues satisfactorily to domestic consumers curtailed somewhat in certain areas by shortage of Sulphuric Acid.

SUPERPHOSPHATE: Supply position on both Single and Triple Superphosphate is exceedingly tight, due primarily to the shortage of Sulphuric Acid.

SULPHATE OF AMMONIA: Demand for this material is beginning to outstrip the supply and the market is definitely tight, at new levels of price established in January and early February by the producers.

AMMONIUM NITRATE: Demand is far in excess of supply with shortages developing in many areas. Prices are firm, and only held in check by recent price freeze.

NITRATE OF SODA: It is reported that domestic production has been considerably curtailed and the producers of the Imported material have advised buyers that the tonnage imported will be allocated on the basis of consumption last season.

GENERAL: Practically all major

Fertilizer ingredients continue in tight supply position with demand strong. Consumers of mixed goods are anticipating somewhat their needs and buying earlier than during the previous season for fear of not getting desired quantities for their crops.

OBITUARIES

John Howard Bennett, Sr., 71, of Clio, South Carolina, district sales representative for Naco Fertilizer Company, January 19 in a Charlotte, North Carolina hospital.

Dr. B. R. Fudge, 49, chief horticulturist for Wilson & Toomer, one of the best known citrus experts in Florida, February 6, in Jacksonville after a heart attack. He was a pioneer of fresh water lake fertilization.

J. Price Oyler, 79, whose firm, Oyler and Spangler, Gettysburg,

Pennsylvania last year observed its 50th anniversary, January 24th of a stroke. At the time of his death he was treasurer of the Central Chemical Company, Hagerstown, Maryland, and had been associate judge of Adams County, Pennsylvania.

William Reeves, 72, for over 48 years associated with the fertilizer concern, Apothecaries Hall Co., Waterbury, Connecticut. In ill health since 1946, he retired in May 1950. Died at his Windsorville, Ct. home. He was widely known as an mc, as interlocutor for minstrel shows, organized the Windsorville Drum Corps.

ARMOUR FERTILIZER WORKS



General office: HURT BUILDING
ATLANTA, GA.

MAILING ADDRESS: P. O. BOX 1685, ATLANTA 1, GA.

Division offices:

Birmingham, Ala.
Montgomery, Ala.
Jacksonville, Fla.
Albany, Ga.
Atlanta, Ga.
Augusta, Ga.
Columbus, Ga.
Chicago Heights, Ill.
East St. Louis, Ill.
New Orleans, La.
Presque Isle, Me.
Baltimore, Md.

New York, N. Y.
Greensboro, N. C.
Wilmington, N. C.
Cincinnati, Ohio
Sandusky, Ohio
Columbia, S. C.
Nashville, Tenn.
Dallas, Tex.
Houston, Tex.
Norfolk, Va.
Havana, Cuba
San Juan, Puerto Rico



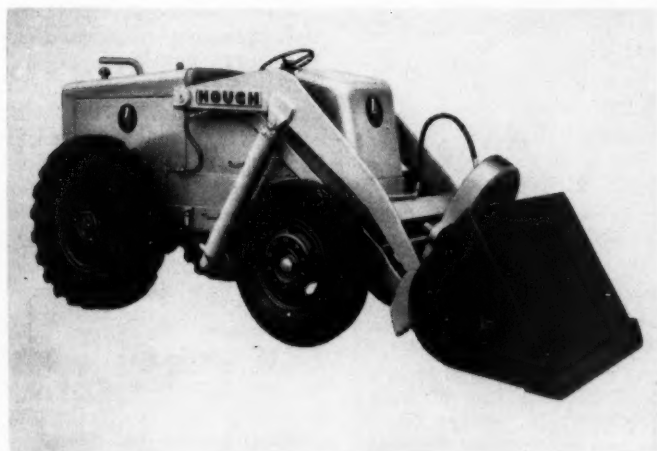
JAITE

HEAVY DUTY MULTI-WALL PAPER BAGS

OFFER DEPENDABLE PROTECTION FOR
YOUR FERTILIZER
THE JAITE COMPANY

"Manufacturers of Paper and Paper Bags"

JAITE, OHIO



This is the newest Hough Payloader tractor shovel, known as Model HY. It has a $1\frac{1}{4}$ cubic yard bucket, a 60 horse power gasoline or diesel engine—and a lot of features they'll be glad to give you if you write The Frank G. Hough Co., 702 Seventh Street, Libertyville, Illinois.

Link-Belt Opens Plant In South Africa

Link-Belt Company announces that its wholly-owned South African subsidiary, Link-Belt Africa Limited, incorporated last January, has purchased a 12,000-square feet manufacturing plant, with separate office building, on a 12-acre plot in Springs, Transvaal, about 28 miles east of Johannesburg, for the purpose of manufacturing conveyor machinery and other Link-Belt products commonly used in South Africa.

Mr. John E. Petersen has been appointed managing director of the South African company.

DOLOMITIC

ANALYSIS
GUARANTEED



LIMESTONE

... 60% Calcium Carbonate
... 39% Magnesium Carbonate

WILLINGHAM-LITTLE STONE COMPANY

1201-4 Healey Building, Atlanta 3, Ga.

"37 Years Service to the Fertilizer Industry in the Southeast"

Pulverizers

Specializing in the reduction of
PHOSPHATE ROCKS
AGRICULTURAL LIMESTONE, ETC.

Capacities: 1 to 50 Tons per Hour
Catalogs on Request

BRADLEY PULVERIZER CO.
ALLENTOWN, PENNA.

Cut Production Costs—

Speed up your plant with
**ATLANTA UTILITY
FERTILIZER MACHINERY**

Fertilizer Mixing Systems	Elevators
Revolving Screens	Fertilizer Shakers
Mixing Plows	Cage Mills
Clod Breakers	Batch Mixers

Write Today for Descriptive Folder

ATLANTA UTILITY WORKS
EAST POINT, GA.

Barrett Re-opens Columbia Service Office

The Barrett Division, Allied Chemical & Dye Corporation, announces the re-opening of its service office at Columbia, S. C. in the Carolina Life Building.

Service work in connection with "Arcadian," the American Nitrate of Soda, "A-N-L" Brand Fertilizer Compound and other nitrogen materials distributed by Barrett for direct application in South Carolina will be handled through the Columbia office, as well as Technical Service for Nitrogen Solutions and mixed fertilizer production in the state.

Howe Scale Opens Two New Branch Offices

The opening of new branch offices at Denver, Colorado and

at Houston, Texas, has been announced by Richard F. Straw, vice president in charge of sales, The Howe Scale Company, Rutland, Vermont.

The Denver office is located at 2524 Walnut Street and is managed by Daniel O. Ferris.

The Houston office is located at 2215 McKinney Avenue and is managed by Henry K. Leonard.

Mr. Straw stated that these new branch offices will increase the scope of the company's sales activities and expand its warehouse and service facilities for its famous line of scales, Weightographs, weight recorders, and hand trucks. The addition of these branches brings the Howe national organization to a total of twenty branch offices with complete sales, service and

warehouse facilities in the leading cities of the United States.

Other branches of The Howe Scale Company are located at: Atlanta, Baltimore, Boston, Buffalo, Chicago, Cincinnati, Cleveland, Kansas City, Los Angeles, Minneapolis, Newark, New Orleans, New York City, Philadelphia, Pittsburgh, St. Louis, San Francisco, and Seattle.

Buda Issues Jack Catalog

A 16 page catalog, No. 1515 has just been released by the Buda Company, Harvey, Illinois, which illustrates and describes their complete line of ratchet, screw and hydraulic jacks. They will gladly send it to you on request.

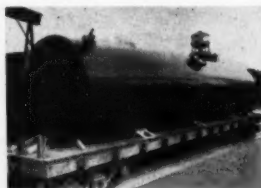


ALUMINUM TANK
9'-0" Diameter x 30'-0" Long
12,825 Gallons

"Cole" can furnish tanks made of **steel, aluminum and stainless steel** — built in accordance with ASME Code to meet all insurance requirements. Measuring tanks of Stainless Steel are carried in stock.

We invite your inquiries for high pressure Storage Tanks to handle Ammonia and Nitrogen Solutions, Anhydrous Ammonia — complete with all steel fittings. Also Elevated Water Tanks, Acid or Oil Storage Tanks, Bins, Boilers, Stacks, etc.

R. D. COLE MFG. COMPANY
Newnan, Ga.



STEEL TANK
8'-6" Diameter x 38'-6" Long
16,500 Gallons



SOUTHERN FERTILIZER & CHEMICAL COMPANY

Main Office: Savannah, Georgia

**Superphosphate — Sulphuric Acid — Complete Fertilizers
Ammoniated Superphosphate**

Export — Import

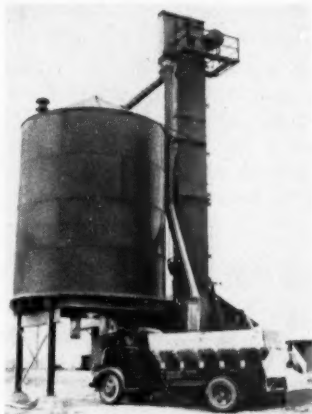
Plants: Savannah, Ga., Atlanta, Ga.,
Charleston, S. C., Roebuck, S. C.

Bulk Phosphate Storage Plans Announced

By C. S. Johnson Co.

Alert to the current trend toward bulk storage and mechanized handling of phosphate, lime, potash and other fertilizers, the C. S. Johnson Company, of Champaign, Illinois, manufacturers of heavy-duty construction mix plants and batching equipment since 1921, announces its entry into the agricultural field with a line of special storage silos and plant equipment.

One popular size of Johnson bulk phosphate storage plant now in operation in rural areas has a silo capacity of 160 tons (based on a material weight of approximately 54 pounds per



Silo by-pass chute on Johnson bulk phosphate storage plant permits loading into trucks direct from rail car, via under-track screw conveyor and elevator. This permits by-passing of silo whenever rail shipments exceed silo capacity.

cubic foot). The single-compartment steel silo features "knock-

down," field-bolted construction for ease in erection. Several other sizes and types of bulk storage plants for phosphate, lime, potash, etc., have been developed by the C. S. Johnson Company, which is a subsidiary of Koehring Company, Milwaukee, manufacturer of heavy-duty construction equipment. The Johnson line also includes special blending plants, bins, batchers, hoppers, clamshell buckets and other auxiliary equipment used in the manufacture, storage and distribution of blended fertilizers.

For more information, or for name of your nearest Johnson distributor, write to the C. S. Johnson Company, Dept. PA., Champaign, Ill.

CAL-MAG OXIDES

CUT YOUR COSTS WITH

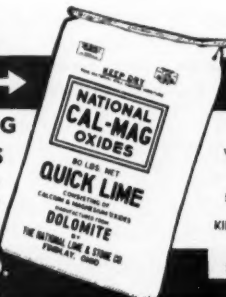
Unexcelled for its superior Dehydrating, Neutralizing, and Curing factors in the preparation of better fertilizers. Write for complete information.

PROMPT SHIPMENTS

Three railroads serve our Carey, Ohio plant—assuring prompt delivery—everywhere.

CAL-MAG OXIDES

MgO 40.39
CaO 58.07
TNP 203.88



We Also Produce
DOLOMITIC
HYDRATED
LIME (105 TNP)
and
KILN DRIED RAW
DOLOMITE
(107 TNP)
Screened to size

NATIONAL LIME and STONE CO.
General Offices FINDLAY, OHIO

CLASSIFIED ADVERTISING

For Sale, Exchange and Wanted Advertisements, same type now used, EIGHT CENTS a word for one insertion; TWELVE CENTS a word for two insertions; FIFTEEN CENTS a word for three insertions, and FOUR CENTS a word for each insertion more than three; ADVERTISEMENTS FOR THIS COLUMN MUST BE PAID IN ADVANCE.

WANTED BY OLD ESTABLISHED FIRM, man between the ages of 30 and 40 to headquarter in and travel the Midwestern territory on fertilizer materials. In replying give full details, references and indication of remuneration desired. Party experienced in this field having acquaintance and contacts with fertilizer manufacturers that area will be given preferred consideration. Box 6, c/o Commercial Fertilizer, 75 Third St., N. W. Atlanta, Georgia.

SEWING MACHINE SERVICE. Feed dogs remilled, sharpened and hardened like new at 1/3 cost of new feeds. Union Special machines rebuilt one week. New and rebuilt Union Special sewing heads and conveyors bought and sold. E. C. Covell, 719 Murdock Road, Baltimore, Md. 12. Towson 5040 Belmont 4335.

WANTED: A Fertilizer Plant to design by competent, experienced engineer. P. O. Box 495, Lakeland, Fla.

"Wanted: Assistant Superintendent for fertilizer plant by old established Ohio manufacturer. Age, preferably, between 30 and 40 years, with knowledge of production and maintenance work. When replying give experience, reference and approximate salary expected. Address Box 8, c/o Commercial Fertilizer, 75 Third St. N. W., Atlanta, Georgia."

SELECTED SPENT FULLERS EARTH

For 25 years THE Conditioner chosen by discriminating Fertilizer Manufacturers

THE DICKERSON COMPANY

Drexel Bldg.

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L. Schwartz & Co., Inc.

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BURLAP BAGS - COTTON BAGS
MULTI-WALL PAPER BAGS

New and Used

Est. over 50 Years.

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Sulphuric Production Service
2032 Monroe Drive, N. E. Atlanta, Ga.

Established authority on chamber plant operations, alterations and construction, and super phosphate production.

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FERTILIZER CHEMISTS

Two Convenient Laboratories

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Atlanta, Ga.

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CHAINS AND SPROCKETS

Jeffrey Hercules Chain and "CHAIN-SAVER" Sprockets make the best wearing combination you can put into your plant. Chains can be reversed—have full diameter, D-shank pins—oval eccentric barrel. Sprockets have flanged edge—takes part of the load.

Also Digger and Loaders, Pulverizers, Conveyors, Elevators, Chains and Attachments, Feeders, etc.



THE JEFFREY MANUFACTURING COMPANY

933 North Fourth Street, Columbus 16, Ohio



IMPORTANT NOTICE

On and after April 15th our General Sales Office will be located at the following new address

1625 EYE Street, N. W.
Washington 6, D. C.
Telephone: STERLING 4990

Our New York office will be discontinued as of the above date.

POTASH COMPANY OF AMERICA Carlsbad, New Mexico

GENERAL SALES OFFICE . . . 50 Broadway, New York, N. Y.
MIDWESTERN SALES OFFICE . . . First National Bank Bldg., Peoria, Ill.
SOUTHERN SALES OFFICE . . . Candler Building, Atlanta, Ga.

BAG CLOSING MACHINES

Engineered



STYLE 21000 H (left), equipped with 80600 H sewing head, is designed for fast, economical closing of paper bags. Bag is sewed, tape-bound, and tape is cut off neatly at each end of closure. Sewing head and conveyor adjustable vertically.

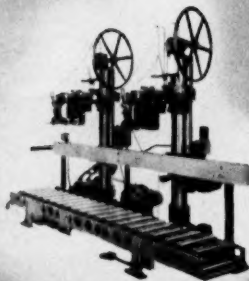


CLASS 20500 (above) machines are heavy duty, high production units for closing medium and heavy weight bags. Available with power-driven horizontal conveyor, inclined conveyor, or both; or with conveyor transmission unit only, for plant production line.



STYLE 20100 H (left), is a heavy duty, high production column type machine designed for use with plant conveyor systems. Sewing head is pedal controlled.

DUPLEX MACHINES (right) are designed for closing double bags. The first sewing head closes the inner bag; the second closes either the outer bag alone, or both bags together for extra safety. Also recommended for single closures where continuous operation is a must — operator can instantly switch to other head.



Union Special

TO MEET MODERN PRODUCTION REQUIREMENTS!

No two jobs are exactly alike — that's why Union Special builds a wide variety of bag closing equipment. In the Union Special line you will find machines for closing all sizes and kinds of bags from small textile or paper bags of one pound, or less, up to the largest jute or multiwall paper bags in use today. And whether your schedule calls for closing just a few bags or for high continuous output, Union Special can supply the equipment to do the work efficiently, economically, dependably! **FOR THE BEST IN BAG CLOSING EQUIPMENT, LOOK TO UNION SPECIAL.** See your Union Special representative for recommendations, or write.

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